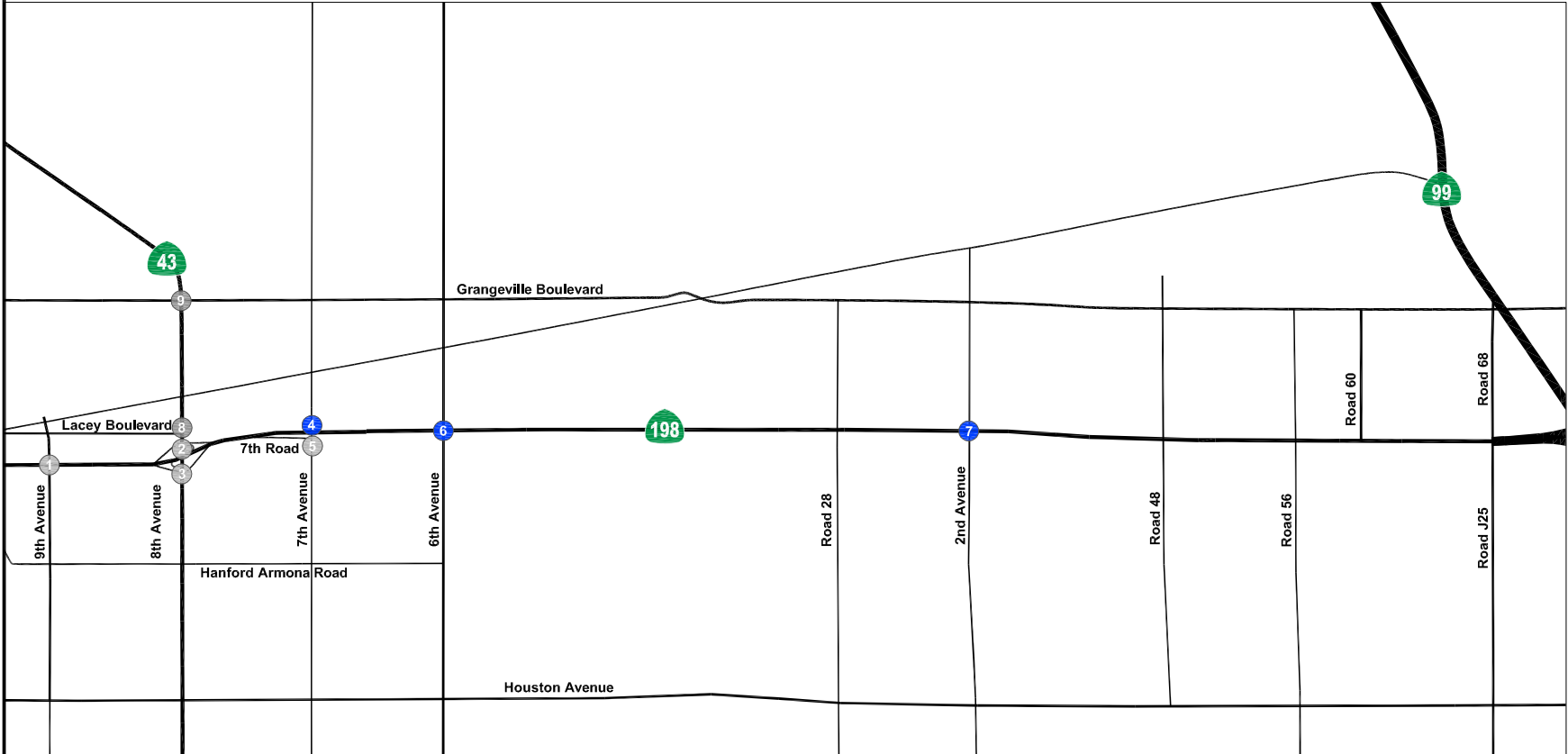
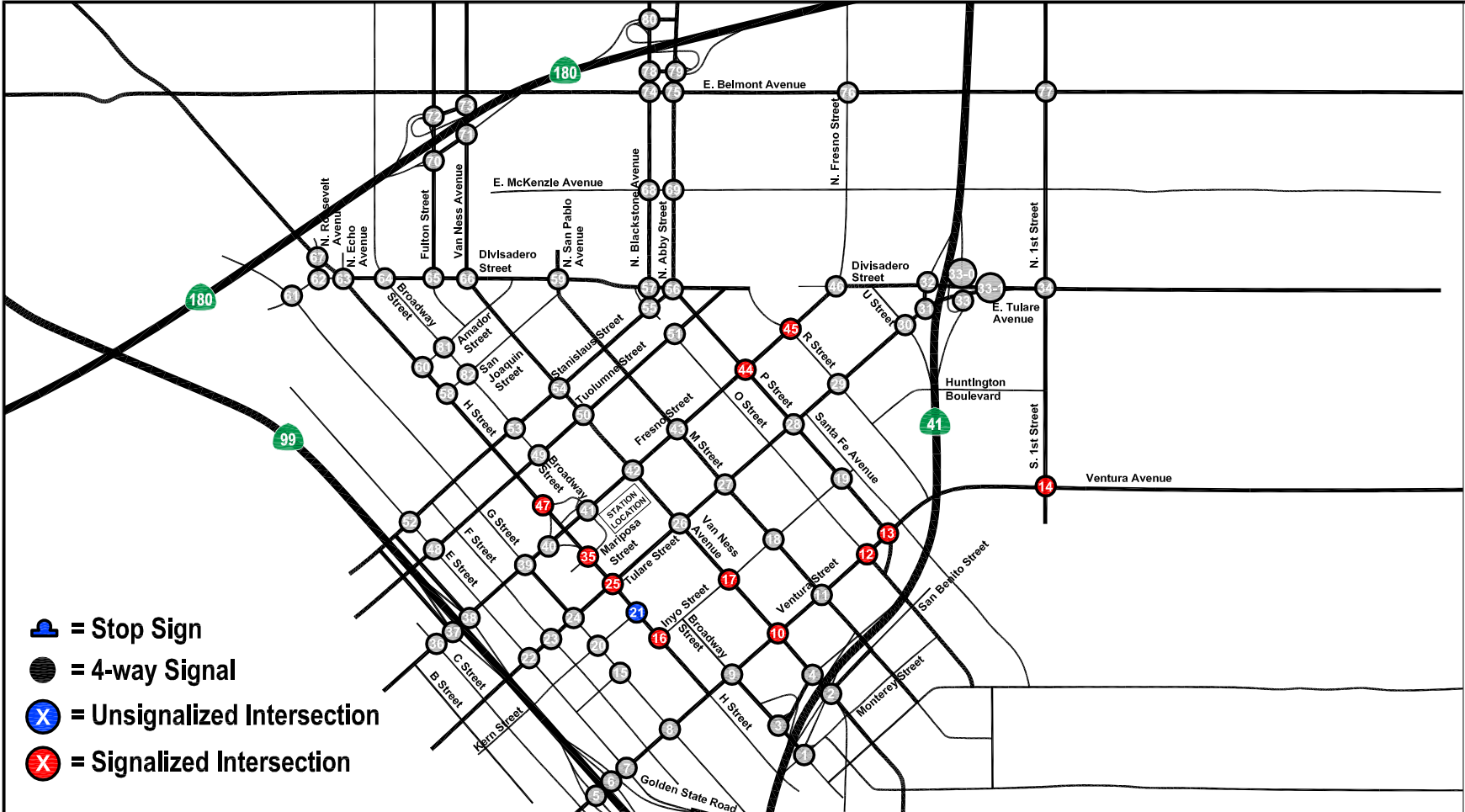


Appendix C

Future Assumed Improvements

FUTURE ASSUMED IMPROVEMENT FIGURE



Fresno Study Intersections

10. Van Ness Avenue / Ventura Street	12. O Street / Ventura Avenue	13. P Street / Ventura Avenue	14. S. 1st Street / Ventura Avenue
16. H Street / Inyo Street	17. Van Ness Street / Inyo Street	21. H Street / Kern Street	25. H Street / Tulare Street
33-0. SR 41 NB On-Ramp / E. Divisadero Street	35. H Street / Mariposa Street / Fresno Street Ramp	44. P Street / Fresno Street	45. R Street / Fresno Street
47. Broadway Street / H Street / Fresno Street Ramp			

Kings//Tulare Regional Station Study Intersections

4. 7th Avenue / SR-198	6. 6th Avenue / SR 198	7. 2nd Avenue / SR 198
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N

Not to scale

Appendix D


















Existing plus Project Synchro Output

FRESNO EXISTING PLUS PROJECT CONDITIONS

HCM Unsignalized Intersection Capacity Analysis

1: Broadway St & Monterey St.


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	58	0	0	92	0	0	0	0	0	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.82	0.82	0.82	0.92	0.92	0.92	0.92	0.92	0.40
Hourly flow rate (vph)	0	79	0	0	112	0	0	0	0	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	112			79			192	192	79	192	192	112
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	112			79			192	192	79	192	192	112
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	98
cM capacity (veh/h)	1477			1519			752	703	981	768	703	941
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	79	112	0	0	20							
Volume Left	0	0	0	0	0							
Volume Right	0	0	0	0	20							
cSH	1477	1519	1700	1700	941							
Volume to Capacity	0.00	0.00	0.00	0.00	0.02							
Queue Length 95th (ft)	0	0	0	0	2							
Control Delay (s)	0.0	0.0	0.0	0.0	8.9							
Lane LOS			A	A	A							
Approach Delay (s)	0.0	0.0	0.0	8.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			14.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Broadway St & Monterey St.
















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	42	0	0	201	0	0	0	0	0	0	76
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.81	0.81	0.81	0.92	0.92	0.92	0.92	0.92	0.66
Hourly flow rate (vph)	0	58	0	0	248	0	0	0	0	0	0	115
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	248			58			306	306	58	306	306	248
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	248			58			306	306	58	306	306	248
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	85
cM capacity (veh/h)	1318			1546			552	607	1008	646	607	791
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	58	248	0	0	115							
Volume Left	0	0	0	0	0							
Volume Right	0	0	0	0	115							
cSH	1318	1546	1700	1700	791							
Volume to Capacity	0.00	0.00	0.00	0.00	0.15							
Queue Length 95th (ft)	0	0	0	0	13							
Control Delay (s)	0.0	0.0	0.0	0.0	10.3							
Lane LOS			A	A	B							
Approach Delay (s)	0.0	0.0	0.0	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			22.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Van Ness Ave & San Benito St
















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	19	268	0	0	196	47	166	82	62	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.85	0.85	0.85	0.92	0.92	0.92
Hourly flow rate (vph)	22	315	0	0	218	52	195	96	73	0	0	0
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2						
Volume Total (vph)	127	210	145	125	244	121						
Volume Left (vph)	22	0	0	0	195	0						
Volume Right (vph)	0	0	0	52	0	73						
Hadj (s)	0.12	0.03	0.03	-0.26	0.43	-0.39						
Departure Headway (s)	6.1	6.0	6.1	5.8	6.5	5.7						
Degree Utilization, x	0.22	0.35	0.25	0.20	0.44	0.19						
Capacity (veh/h)	559	572	560	585	529	599						
Control Delay (s)	9.6	11.1	10.0	9.1	13.3	8.8						
Approach Delay (s)	10.5		9.6		11.8							
Approach LOS	B		A		B							
Intersection Summary												
Delay			10.8									
HCM Level of Service			B									
Intersection Capacity Utilization			34.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Van Ness Ave & San Benito St







4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	78	174	0	0	214	52	141	30	41	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.82	0.82	0.82	0.80	0.80	0.80	0.92	0.92	0.92
Hourly flow rate (vph)	94	210	0	0	261	63	176	38	51	0	0	0
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2						
Volume Total (vph)	164	140	174	150	195	70						
Volume Left (vph)	94	0	0	0	176	0						
Volume Right (vph)	0	0	0	63	0	51						
Hadj (s)	0.32	0.03	0.03	-0.26	0.49	-0.48						
Departure Headway (s)	6.1	5.8	5.8	5.5	6.5	5.6						
Degree Utilization, x	0.28	0.22	0.28	0.23	0.35	0.11						
Capacity (veh/h)	567	595	598	628	521	603						
Control Delay (s)	10.2	9.3	9.8	8.9	11.9	8.1						
Approach Delay (s)	9.8		9.4		10.9							
Approach LOS	A		A		B							
Intersection Summary												
Delay			10.0									
HCM Level of Service			A									
Intersection Capacity Utilization			32.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: 41 SB Off-Ramp &







4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↑	↑		↑	↑
Volume (veh/h)	0	126	59	0	6	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.81	0.81	0.78	0.78	0.60	0.60
Hourly flow rate (vph)	0	156	76	0	10	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1131				
pX, platoon unblocked						
vC, conflicting volume	76				231	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76				231	76
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1523				757	986
Direction, Lane #	SE 1	NW 1	SW 1	SW 2		
Volume Total	156	76	10	10		
Volume Left	0	0	10	0		
Volume Right	0	0	0	10		
cSH	1700	1700	757	986		
Volume to Capacity	0.09	0.04	0.01	0.01		
Queue Length 95th (ft)	0	0	1	1		
Control Delay (s)	0.0	0.0	9.8	8.7		
Lane LOS			A	A		
Approach Delay (s)	0.0	0.0	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			16.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: 41 SB Off-Ramp &

















4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↑	↑		↘	↗
Volume (veh/h)	0	256	98	0	16	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.74	0.74	0.82	0.82	0.75	0.75
Hourly flow rate (vph)	0	346	120	0	21	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1131				
pX, platoon unblocked						
vC, conflicting volume	120				465	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	120				465	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	99
cM capacity (veh/h)	1468				555	932
Direction, Lane #	SE 1	NW 1	SW 1	SW 2		
Volume Total	346	120	21	11		
Volume Left	0	0	21	0		
Volume Right	0	0	0	11		
cSH	1700	1700	555	932		
Volume to Capacity	0.20	0.07	0.04	0.01		
Queue Length 95th (ft)	0	0	3	1		
Control Delay (s)	0.0	0.0	11.7	8.9		
Lane LOS			B	A		
Approach Delay (s)	0.0	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			23.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Van Ness Ave & 41 SB Off-Ramp

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	118	2	3	357	0	0	0	0	170	13	410
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.84	0.84	0.84	0.92	0.92	0.92	0.71	0.71	0.71
Hourly flow rate (vph)	0	155	3	4	425	0	0	0	0	239	18	577
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		735										
pX, platoon unblocked												
vC, conflicting volume	425			158			385	589	157	589	590	212
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425			158			385	589	157	589	590	212
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	39	96	27
cM capacity (veh/h)	1131			1419			143	418	861	391	418	793
Direction, Lane #	SE 1	NW 1	NW 2	SW 1	SW 2							
Volume Total	158	145	283	450	385							
Volume Left	0	4	0	239	0							
Volume Right	3	0	0	192	385							
cSH	1700	1419	1700	501	793							
Volume to Capacity	0.09	0.00	0.17	0.90	0.49							
Queue Length 95th (ft)	0	0	0	255	67							
Control Delay (s)	0.0	0.2	0.0	47.9	13.8							
Lane LOS		A		E	B							
Approach Delay (s)	0.0	0.1		32.2								
Approach LOS				D								
Intersection Summary												
Average Delay			18.9									
Intersection Capacity Utilization			37.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Van Ness Ave & 41 SB Off-Ramp




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	197	17	11	343	0	0	0	0	58	10	182
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.86	0.86	0.86	0.92	0.92	0.92	0.81	0.81	0.81
Hourly flow rate (vph)	0	249	22	13	399	0	0	0	0	72	12	225
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		735										
pX, platoon unblocked												
vC, conflicting volume	399			271			491	685	260	685	695	199
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	399			271			491	685	260	685	695	199
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	78	97	72
cM capacity (veh/h)	1156			1290			321	366	739	332	361	808
Direction, Lane #	SE 1	NW 1	NW 2	SW 1	SW 2							
Volume Total	271	146	266	159	150							
Volume Left	0	13	0	72	0							
Volume Right	22	0	0	75	150							
cSH	1700	1290	1700	464	808							
Volume to Capacity	0.16	0.01	0.16	0.34	0.19							
Queue Length 95th (ft)	0	1	0	38	17							
Control Delay (s)	0.0	0.8	0.0	16.8	10.5							
Lane LOS		A		C	B							
Approach Delay (s)	0.0	0.3		13.7								
Approach LOS				B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			31.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

5: SR99 S Off-ramp & Ventura Ave


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								 			 	
Volume (vph)	294	0	317	0	0	0	0	587	56	44	308	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2						5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00						0.95		1.00	0.95	
Frt	1.00	0.85						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583						3493		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.28	1.00	
Satd. Flow (perm)	1770	1583						3493		531	3539	
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.72	0.72	0.72	0.78	0.78	0.78
Adj. Flow (vph)	354	0	382	0	0	0	0	815	78	56	395	0
RTOR Reduction (vph)	0	278	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	354	104	0	0	0	0	0	877	0	56	395	0
Turn Type	Split									Perm		
Protected Phases	4	4						2			2	
Permitted Phases										2		
Actuated Green, G (s)	12.2	12.2						23.0		23.0	23.0	
Effective Green, g (s)	12.2	12.2						23.0		23.0	23.0	
Actuated g/C Ratio	0.27	0.27						0.52		0.52	0.52	
Clearance Time (s)	4.2	4.2						5.2		5.2	5.2	
Vehicle Extension (s)	5.2	5.2						0.2		0.2	0.2	
Lane Grp Cap (vph)	484	433						1801		274	1825	
v/s Ratio Prot	c0.20	0.07						c0.25			0.11	
v/s Ratio Perm										0.11		
v/c Ratio	0.73	0.24						0.49		0.20	0.22	
Uniform Delay, d1	14.7	12.6						7.0		5.8	5.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	7.0	0.6						0.1		0.1	0.0	
Delay (s)	21.7	13.2						7.1		6.0	5.9	
Level of Service	C	B						A		A	A	
Approach Delay (s)		17.3			0.0			7.1			5.9	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			10.4									
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			44.6									
Intersection Capacity Utilization			62.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

















5: SR99 S Off-ramp & Ventura Ave

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	149	2	198	0	0	0	0	561	33	114	382	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2						5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00						0.95		1.00	0.95	
Frt	1.00	0.85						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	1586						3510		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.41	1.00	
Satd. Flow (perm)	1770	1586						3510		757	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	159	2	211	0	0	0	0	610	36	121	406	0
RTOR Reduction (vph)	0	168	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	159	45	0	0	0	0	0	637	0	121	406	0
Turn Type	Split									Perm		
Protected Phases	4	4						2			2	
Permitted Phases										2		
Actuated Green, G (s)	8.6	8.6						23.8		23.8	23.8	
Effective Green, g (s)	8.6	8.6						23.8		23.8	23.8	
Actuated g/C Ratio	0.21	0.21						0.57		0.57	0.57	
Clearance Time (s)	4.2	4.2						5.2		5.2	5.2	
Vehicle Extension (s)	5.2	5.2						0.2		0.2	0.2	
Lane Grp Cap (vph)	364	326						1999		431	2015	
v/s Ratio Prot	c0.09	0.03						c0.18			0.11	
v/s Ratio Perm										0.16		
v/c Ratio	0.44	0.14						0.32		0.28	0.20	
Uniform Delay, d1	14.5	13.6						4.7		4.6	4.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.4						0.0		0.1	0.0	
Delay (s)	16.4	14.0						4.8		4.7	4.4	
Level of Service	B	B						A		A	A	
Approach Delay (s)		15.0			0.0			4.8			4.5	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			7.1							A		
HCM Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			41.8							9.4		
Intersection Capacity Utilization			62.9%							B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 6: SR99 N On-Ramp & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	31	7	83	326	550	0	0	318	105
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.70	0.70	0.70	0.76	0.76	0.76	0.86	0.86	0.86
Hourly flow rate (vph)	0	0	0	44	10	119	429	724	0	0	370	122
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								284			1117	
pX, platoon unblocked												
vC, conflicting volume	1774	2012	246	1766	2073	362	492			724		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1774	2012	246	1766	2073	362	492			724		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	69	81	60			100		
cM capacity (veh/h)	23	35	754	36	32	635	1068			875		
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	49	124	429	362	362	247	245					
Volume Left	44	0	429	0	0	0	0					
Volume Right	0	119	0	0	0	0	122					
cSH	36	359	1068	1700	1700	1700	1700					
Volume to Capacity	1.37	0.34	0.40	0.21	0.21	0.15	0.14					
Queue Length 95th (ft)	130	37	49	0	0	0	0					
Control Delay (s)	450.8	20.2	10.6	0.0	0.0	0.0	0.0					
Lane LOS	F	C	B									
Approach Delay (s)	142.9		4.0			0.0						
Approach LOS	F											
Intersection Summary												
Average Delay			16.1									
Intersection Capacity Utilization			62.1%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: SR99 N On-Ramp & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	23	2	69	275	431	0	0	474	408
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.59	0.59	0.59	0.94	0.94	0.94	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	39	3	117	293	459	0	0	533	458
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								284			1117	
pX, platoon unblocked												
vC, conflicting volume	1695	1805	496	1310	2035	229	991			459		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1695	1805	496	1310	2035	229	991			459		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	50	90	85	58			100		
cM capacity (veh/h)	32	45	520	78	33	773	693			1099		
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	41	119	293	229	229	355	636					
Volume Left	39	0	293	0	0	0	0					
Volume Right	0	117	0	0	0	0	458					
cSH	74	584	693	1700	1700	1700	1700					
Volume to Capacity	0.55	0.20	0.42	0.13	0.13	0.21	0.37					
Queue Length 95th (ft)	59	19	53	0	0	0	0					
Control Delay (s)	101.9	12.7	13.9	0.0	0.0	0.0	0.0					
Lane LOS	F	B	B									
Approach Delay (s)	35.5		5.4			0.0						
Approach LOS	E											
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			62.9%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: E St & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	21	4	27	14	10	13	41	601	3	1	377	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.93	0.93	0.93	0.71	0.71	0.71	0.84	0.84	0.84
Hourly flow rate (vph)	26	5	33	15	11	14	58	846	4	1	449	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								595			806	
pX, platoon unblocked												
vC, conflicting volume	1024	1432	239	1227	1445	425	479			851		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1024	1432	239	1227	1445	425	479			851		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	96	96	87	91	98	95			100		
cM capacity (veh/h)	165	126	762	120	124	577	1080			783		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	64	40	481	427	226	254						
Volume Left	26	15	58	0	1	0						
Volume Right	33	14	0	4	0	30						
cSH	268	168	1080	1700	783	1700						
Volume to Capacity	0.24	0.24	0.05	0.25	0.00	0.15						
Queue Length 95th (ft)	23	22	4	0	0	0						
Control Delay (s)	22.6	33.0	1.6	0.0	0.1	0.0						
Lane LOS	C	D	A		A							
Approach Delay (s)	22.6	33.0	0.8		0.0							
Approach LOS	C	D										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			43.2%								A	
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: E St & Ventura Ave





















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	33	2	80	9	9	18	56	435	5	2	796	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.75	0.75	0.75	0.89	0.89	0.89	0.88	0.88	0.88
Hourly flow rate (vph)	49	3	118	12	12	24	63	489	6	2	905	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								595			806	
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91					
vC, conflicting volume	1326	1546	469	1193	1561	247	939			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1162	1404	221	1016	1419	247	736			494		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	57	97	83	91	89	97	92			100		
cM capacity (veh/h)	114	116	713	134	113	753	788			1066		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	169	48	307	250	455	486						
Volume Left	49	12	63	0	2	0						
Volume Right	118	24	0	6	0	34						
cSH	275	211	788	1700	1066	1700						
Volume to Capacity	0.62	0.23	0.08	0.15	0.00	0.29						
Queue Length 95th (ft)	94	21	6	0	0	0						
Control Delay (s)	37.1	27.0	2.8	0.0	0.1	0.0						
Lane LOS	E	D	A		A							
Approach Delay (s)	37.1	27.0	1.5		0.0							
Approach LOS	E	D										
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			56.4%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis





















8: G St & Ventura Ave

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	24	74	14	36	107	72	38	535	32	38	343	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818		1770	1750		1770	3509		1770	3488	
Flt Permitted	0.63	1.00		0.68	1.00		0.51	1.00		0.34	1.00	
Satd. Flow (perm)	1173	1818		1269	1750		946	3509		640	3488	
Peak-hour factor, PHF	0.75	0.75	0.75	0.88	0.88	0.88	0.81	0.81	0.81	0.91	0.91	0.91
Adj. Flow (vph)	32	99	19	41	122	82	47	660	40	42	377	40
RTOR Reduction (vph)	0	11	0	0	40	0	0	7	0	0	12	0
Lane Group Flow (vph)	32	107	0	41	164	0	47	693	0	42	405	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	18.6	18.6		18.6	18.6		26.1	26.1		26.1	26.1	
Effective Green, g (s)	18.6	18.6		18.6	18.6		26.1	26.1		26.1	26.1	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.49	0.49		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	409	633		442	610		462	1715		313	1705	
v/s Ratio Prot		0.06			c0.09			c0.20			0.12	
v/s Ratio Perm	0.03			0.03			0.05			0.07		
v/c Ratio	0.08	0.17		0.09	0.27		0.10	0.40		0.13	0.24	
Uniform Delay, d1	11.7	12.0		11.7	12.5		7.3	8.7		7.5	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3		0.2	0.5		0.2	0.3		0.4	0.2	
Delay (s)	11.8	12.3		11.9	13.0		7.5	9.0		7.9	8.0	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		12.2			12.8			8.9			8.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			9.6			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			53.4			Sum of lost time (s)				8.7		
Intersection Capacity Utilization			58.8%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 8: G St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	69	86	69	69	139	88	26	438	27	55	709	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1739		1770	1754		1770	3508		1770	3512	
Flt Permitted	0.57	1.00		0.65	1.00		0.26	1.00		0.46	1.00	
Satd. Flow (perm)	1064	1739		1209	1754		479	3508		858	3512	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.94	0.94	0.94	0.85	0.85	0.85
Adj. Flow (vph)	76	95	76	74	149	95	28	466	29	65	834	45
RTOR Reduction (vph)	0	47	0	0	38	0	0	7	0	0	6	0
Lane Group Flow (vph)	76	124	0	74	206	0	28	488	0	65	873	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	19.7	19.7		19.7	19.7		27.5	27.5		27.5	27.5	
Effective Green, g (s)	19.7	19.7		19.7	19.7		27.5	27.5		27.5	27.5	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.49	0.49		0.49	0.49	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	375	613		426	618		236	1726		422	1728	
v/s Ratio Prot		0.07			c0.12			0.14			c0.25	
v/s Ratio Perm	0.07			0.06			0.06			0.08		
v/c Ratio	0.20	0.20		0.17	0.33		0.12	0.28		0.15	0.51	
Uniform Delay, d1	12.6	12.6		12.5	13.3		7.7	8.4		7.8	9.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.3		0.4	0.7		0.5	0.2		0.4	0.5	
Delay (s)	13.2	13.0		12.9	14.0		8.1	8.6		8.2	10.1	
Level of Service	B	B		B	B		A	A		A	B	
Approach Delay (s)		13.0			13.7			8.5			10.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			55.9			Sum of lost time (s)				8.7		
Intersection Capacity Utilization			86.2%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Broadway St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	17	17	4	60	38	5	7	449	107	14	417	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3441		1770	1828		1770	3437		1770	3523	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3441		1770	1828		1770	3437		1770	3523	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.79	0.79	0.79	0.95	0.95	0.95
Adj. Flow (vph)	22	22	5	79	50	7	9	568	135	15	439	14
RTOR Reduction (vph)	0	4	0	0	4	0	0	14	0	0	1	0
Lane Group Flow (vph)	22	23	0	79	53	0	9	689	0	15	452	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.6	5.6		8.9	8.9		1.0	20.9		1.0	20.9	
Effective Green, g (s)	5.6	5.6		8.9	8.9		1.0	20.9		1.0	20.9	
Actuated g/C Ratio	0.10	0.10		0.16	0.16		0.02	0.37		0.02	0.37	
Clearance Time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	178	345		282	292		32	1287		32	1320	
v/s Ratio Prot	c0.01	0.01		c0.04	0.03		0.01	c0.20		c0.01	0.13	
v/s Ratio Perm												
v/c Ratio	0.12	0.07		0.28	0.18		0.28	0.54		0.47	0.34	
Uniform Delay, d1	22.9	22.7		20.6	20.3		27.0	13.6		27.1	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.0		0.2	0.1		1.8	0.2		3.9	0.1	
Delay (s)	23.0	22.8		20.8	20.4		28.8	13.9		31.0	12.6	
Level of Service	C	C		C	C		C	B		C	B	
Approach Delay (s)		22.9			20.7			14.1			13.2	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			14.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			55.8			Sum of lost time (s)			19.4			
Intersection Capacity Utilization			34.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Broadway St & Ventura Ave






















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	28	89	15	69	18	11	19	410	140	54	719	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3463		1770	1756		1770	3404		1770	3527	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3463		1770	1756		1770	3404		1770	3527	
Peak-hour factor, PHF	0.62	0.62	0.62	0.84	0.84	0.84	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	45	144	24	82	21	13	21	451	154	57	765	18
RTOR Reduction (vph)	0	11	0	0	11	0	0	25	0	0	1	0
Lane Group Flow (vph)	45	157	0	82	23	0	21	580	0	57	782	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.1	13.1		8.8	8.8		2.6	20.9		4.3	22.6	
Effective Green, g (s)	13.1	13.1		8.8	8.8		2.6	20.9		4.3	22.6	
Actuated g/C Ratio	0.20	0.20		0.13	0.13		0.04	0.31		0.06	0.34	
Clearance Time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	349	682		234	232		69	1070		114	1199	
v/s Ratio Prot	0.03	c0.05		c0.05	0.01		0.01	0.17		c0.03	c0.22	
v/s Ratio Perm												
v/c Ratio	0.13	0.23		0.35	0.10		0.30	0.54		0.50	0.65	
Uniform Delay, d1	22.0	22.5		26.2	25.4		31.1	18.8		30.1	18.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.3	0.1		0.9	0.3		1.3	1.0	
Delay (s)	22.1	22.5		26.6	25.4		32.0	19.1		31.3	19.6	
Level of Service	C	C		C	C		C	B		C	B	
Approach Delay (s)		22.4			26.2			19.6			20.4	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			20.7			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			66.5			Sum of lost time (s)			15.2			
Intersection Capacity Utilization			49.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Van Ness Ave & Ventura Ave

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	20	75	33	199	522	137	55	377	42	38	246	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2		4.2	4.2	4.2	4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1778		1770	1863	1583	1770	3486		1770	3411	
Flt Permitted	0.25	1.00		0.67	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	469	1778		1246	1863	1583	1770	3486		1770	3411	
Peak-hour factor, PHF	0.78	0.78	0.78	0.87	0.87	0.87	0.80	0.80	0.80	0.83	0.83	0.83
Adj. Flow (vph)	26	96	42	229	600	157	69	471	52	46	296	94
RTOR Reduction (vph)	0	15	0	0	0	30	0	8	0	0	31	0
Lane Group Flow (vph)	26	123	0	229	600	127	69	515	0	46	359	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	36.1	36.1		36.1	36.1	36.1	9.1	22.7		4.0	17.6	
Effective Green, g (s)	36.1	36.1		36.1	36.1	36.1	9.1	22.7		4.0	17.6	
Actuated g/C Ratio	0.48	0.48		0.48	0.48	0.48	0.12	0.30		0.05	0.23	
Clearance Time (s)	4.2	4.2		4.2	4.2	4.2	4.0	4.2		4.0	4.2	
Vehicle Extension (s)	4.8	4.8		4.8	4.8	4.8	2.0	4.8		2.0	4.8	
Lane Grp Cap (vph)	225	854		598	894	760	214	1052		94	798	
v/s Ratio Prot		0.07			c0.32		0.04	c0.15		0.03	c0.11	
v/s Ratio Perm	0.06			0.18		0.08						
v/c Ratio	0.12	0.14		0.38	0.67	0.17	0.32	0.49		0.49	0.45	
Uniform Delay, d1	10.8	10.9		12.5	15.0	11.1	30.2	21.5		34.6	24.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.8	2.5	0.2	0.3	0.7		1.5	0.8	
Delay (s)	11.2	11.1		13.3	17.5	11.3	30.5	22.2		36.1	25.4	
Level of Service	B	B		B	B	B	C	C		D	C	
Approach Delay (s)		11.1			15.5			23.2			26.6	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			19.5			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			75.2			Sum of lost time (s)		12.6				
Intersection Capacity Utilization			54.6%			ICU Level of Service		A				
Analysis Period (min)			15									
c Critical Lane Group												


















10: Van Ness Ave & Ventura Ave

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	81	175	59	198	282	62	38	371	40	34	532	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2		4.2	4.2	4.2	4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1792		1770	1863	1583	1770	3488		1770	3465	
Flt Permitted	0.46	1.00		0.53	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	860	1792		987	1863	1583	1770	3488		1770	3465	
Peak-hour factor, PHF	0.88	0.88	0.88	0.87	0.87	0.87	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	92	199	67	228	324	71	41	399	43	42	657	107
RTOR Reduction (vph)	0	13	0	0	0	30	0	7	0	0	11	0
Lane Group Flow (vph)	92	253	0	228	324	41	41	435	0	42	753	0
Turn Type	Perm			Perm			Prot	Prot				
Protected Phases	4			8			5	2			1	6
Permitted Phases	4			8			8					
Actuated Green, G (s)	25.7	25.7		25.7	25.7	25.7	3.6	24.5		3.6	24.5	
Effective Green, g (s)	25.7	25.7		25.7	25.7	25.7	3.6	24.5		3.6	24.5	
Actuated g/C Ratio	0.39	0.39		0.39	0.39	0.39	0.05	0.37		0.05	0.37	
Clearance Time (s)	4.2	4.2		4.2	4.2	4.2	4.0	4.2		4.0	4.2	
Vehicle Extension (s)	4.8	4.8		4.8	4.8	4.8	2.0	4.8		2.0	4.8	
Lane Grp Cap (vph)	334	696		383	723	615	96	1291		96	1282	
v/s Ratio Prot		0.14			0.17		0.02	c0.12		0.02	c0.22	
v/s Ratio Perm	0.11			c0.23		0.03						
v/c Ratio	0.28	0.36		0.60	0.45	0.07	0.43	0.34		0.44	0.59	
Uniform Delay, d1	13.9	14.4		16.1	15.0	12.7	30.3	15.0		30.3	16.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6		3.6	0.9	0.1	1.1	0.3		1.2	1.0	
Delay (s)	14.7	15.0		19.7	15.9	12.8	31.4	15.3		31.5	17.8	
Level of Service	B	B		B	B	B	C	B		C	B	
Approach Delay (s)		15.0			16.9			16.7			18.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			17.1		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			66.2		Sum of lost time (s)					8.4		
Intersection Capacity Utilization			60.1%									

HCM Signalized Intersection Capacity Analysis

11: M St & Ventura Ave

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	38	183	19	0	0	0	0	390	20	24	412	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.99		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5042	1583					3513		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.45	1.00	
Satd. Flow (perm)		5042	1583					3513		842	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.81	0.81	0.81	0.84	0.84	0.84
Adj. Flow (vph)	42	203	21	0	0	0	0	481	25	29	490	0
RTOR Reduction (vph)	0	0	13	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	245	8	0	0	0	0	501	0	29	490	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4							6		
Actuated Green, G (s)		20.0	20.0					25.0		25.0	25.0	
Effective Green, g (s)		20.0	20.0					25.0		25.0	25.0	
Actuated g/C Ratio		0.37	0.37					0.47		0.47	0.47	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		2.0	2.0					2.0		2.0	2.0	
Lane Grp Cap (vph)		1888	593					1645		394	1657	
v/s Ratio Prot		c0.05						c0.14			0.14	
v/s Ratio Perm			0.00							0.03		
v/c Ratio		0.13	0.01					0.30		0.07	0.30	
Uniform Delay, d1		11.0	10.5					8.8		7.8	8.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0					0.0		0.0	0.0	
Delay (s)		11.0	10.5					8.8		7.9	8.8	
Level of Service		B	B					A		A	A	
Approach Delay (s)		11.0			0.0			8.8			8.7	
Approach LOS		B			A			A			A	


















Intersection Summary

HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	8.4
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

11: M St & Ventura Ave

























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	62	486	11	0	0	0	0	553	17	67	718	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					1.00		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5057	1583					3523		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.39	1.00	
Satd. Flow (perm)		5057	1583					3523		727	3539	
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.94	0.94	0.94	0.81	0.81	0.81
Adj. Flow (vph)	77	600	14	0	0	0	0	588	18	83	886	0
RTOR Reduction (vph)	0	0	9	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	677	5	0	0	0	0	603	0	83	886	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4							6		
Actuated Green, G (s)		20.0	20.0					25.0		25.0	25.0	
Effective Green, g (s)		20.0	20.0					25.0		25.0	25.0	
Actuated g/C Ratio		0.37	0.37					0.47		0.47	0.47	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		2.0	2.0					2.0		2.0	2.0	
Lane Grp Cap (vph)		1894	593					1649		340	1657	
v/s Ratio Prot		c0.13						0.17			c0.25	
v/s Ratio Perm			0.00							0.11		
v/c Ratio		0.36	0.01					0.37		0.24	0.53	
Uniform Delay, d1		12.1	10.5					9.1		8.5	10.1	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0					0.1		0.1	0.2	
Delay (s)		12.1	10.5					9.2		8.7	10.2	
Level of Service		B	B					A		A	B	
Approach Delay (s)		12.1			0.0			9.2			10.1	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM Average Control Delay			10.5							B		
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			53.4							8.4		
Intersection Capacity Utilization			68.8%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: O St & Ventura Ave

























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	24	12	16	79	313	6	85	343	3	8	345	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1681	1767	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1681	1767	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.65	0.65	0.65	0.86	0.86	0.86	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	37	18	25	92	364	7	104	418	4	10	421	43
RTOR Reduction (vph)	0	0	23	0	0	3	0	0	3	0	0	32
Lane Group Flow (vph)	37	18	2	83	373	4	104	418	1	10	421	11
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	5		6	6		3	8		7	4	
Permitted Phases			5			6			8			4
Actuated Green, G (s)	7.4	7.4	7.4	35.7	35.7	35.7	10.0	31.7	31.7	1.1	22.8	22.8
Effective Green, g (s)	7.4	7.4	7.4	35.7	35.7	35.7	10.0	31.7	31.7	1.1	22.8	22.8
Actuated g/C Ratio	0.08	0.08	0.08	0.39	0.39	0.39	0.11	0.34	0.34	0.01	0.25	0.25
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Vehicle Extension (s)	4.9	4.9	4.9	4.9	4.9	4.9	2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	142	149	127	649	682	611	191	1213	542	21	872	390
v/s Ratio Prot	c0.02	0.01		0.05	c0.21		c0.06	0.12		0.01	c0.12	
v/s Ratio Perm			0.00			0.00			0.00			0.01
w/c Ratio	0.26	0.12	0.02	0.13	0.55	0.01	0.54	0.34	0.00	0.48	0.48	0.03
Uniform Delay, d1	40.0	39.5	39.2	18.3	22.1	17.5	39.1	22.7	20.0	45.4	29.8	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.7	0.1	0.2	1.5	0.0	1.7	0.3	0.0	6.1	0.9	0.1
Delay (s)	42.0	40.3	39.3	18.5	23.6	17.5	40.8	23.0	20.0	51.5	30.7	26.5
Level of Service	D	D	D	B	C	B	D	C	C	D	C	C
Approach Delay (s)		40.7			22.6			26.5			30.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			27.4			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			92.5			Sum of lost time (s)			16.6			
Intersection Capacity Utilization			44.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: O St & Ventura Ave



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	85	34	162	56	93	11	43	563	10	5	568	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1681	1764	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1681	1764	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.70	0.70	0.70	0.86	0.86	0.86	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	121	49	231	65	108	13	47	612	11	6	638	25
RTOR Reduction (vph)	0	0	187	0	0	11	0	0	6	0	0	12
Lane Group Flow (vph)	121	49	44	58	115	2	47	612	5	6	638	13
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	5		6	6		3	8		7	4	
Permitted Phases			5			6			8			4
Actuated Green, G (s)	14.7	14.7	14.7	13.6	13.6	13.6	4.2	30.6	30.6	0.9	27.3	27.3
Effective Green, g (s)	14.7	14.7	14.7	13.6	13.6	13.6	4.2	30.6	30.6	0.9	27.3	27.3
Actuated g/C Ratio	0.19	0.19	0.19	0.18	0.18	0.18	0.05	0.40	0.40	0.01	0.36	0.36
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Vehicle Extension (s)	4.9	4.9	4.9	4.9	4.9	4.9	2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	341	358	305	299	314	282	97	1417	634	21	1265	566
v/s Ratio Prot	c0.07	0.03		0.03	c0.07		c0.03	c0.17		0.00	c0.18	
v/s Ratio Perm			0.03			0.00			0.00			0.01
v/c Ratio	0.35	0.14	0.15	0.19	0.37	0.01	0.48	0.43	0.01	0.29	0.50	0.02
Uniform Delay, d1	26.7	25.6	25.6	26.7	27.6	25.8	35.0	16.6	13.8	37.4	19.2	15.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.4	0.4	0.6	1.5	0.0	1.4	0.4	0.0	2.7	0.6	0.0
Delay (s)	28.0	25.9	26.1	27.4	29.1	25.9	36.4	17.0	13.8	40.2	19.9	15.9
Level of Service	C	C	C	C	C	C	D	B	B	D	B	B
Approach Delay (s)		26.6			28.3			18.3			19.9	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			21.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			76.4			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			42.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: P St & Ventura Ave


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	35	89	112	40	342	0	0	373	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	
Frt					1.00	0.85	1.00	1.00			0.96	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					3490	1583	1770	3539			3414	
Flt Permitted					0.99	1.00	0.44	1.00			1.00	
Satd. Flow (perm)					3490	1583	822	3539			3414	
Peak-hour factor, PHF	0.92	0.92	0.92	0.69	0.69	0.69	0.81	0.81	0.81	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	51	129	162	49	422	0	0	429	133
RTOR Reduction (vph)	0	0	0	0	0	126	0	0	0	0	36	0
Lane Group Flow (vph)	0	0	0	0	180	36	49	422	0	0	526	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					8.0	8.0	20.0	20.0			20.0	
Effective Green, g (s)					8.0	8.0	20.0	20.0			20.0	
Actuated g/C Ratio					0.22	0.22	0.55	0.55			0.55	
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	
Lane Grp Cap (vph)					767	348	452	1945			1876	
v/s Ratio Prot					c0.05			0.12			c0.15	
v/s Ratio Perm						0.02	0.06					
v/c Ratio					0.23	0.10	0.11	0.22			0.28	
Uniform Delay, d1					11.7	11.3	3.9	4.2			4.4	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.1	0.0	0.0	0.0			0.0	
Delay (s)					11.7	11.4	4.0	4.2			4.4	
Level of Service					B	B	A	A			A	
Approach Delay (s)		0.0			11.6			4.2			4.4	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			6.1		HCM Level of Service						A	
HCM Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			36.4		Sum of lost time (s)					8.4		
Intersection Capacity Utilization			46.9%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: P St & Ventura Ave























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	31	50	119	74	585	0	0	564	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.98	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					3473	1583	1770	3539			3473	
Flt Permitted					0.98	1.00	0.37	1.00			1.00	
Satd. Flow (perm)					3473	1583	690	3539			3473	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	38	61	145	81	643	0	0	648	92
RTOR Reduction (vph)	0	0	0	0	0	120	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	99	25	81	643	0	0	728	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					6.0	6.0	20.5	20.5			20.5	
Effective Green, g (s)					6.0	6.0	20.5	20.5			20.5	
Actuated g/C Ratio					0.17	0.17	0.59	0.59			0.59	
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	
Lane Grp Cap (vph)					597	272	405	2079			2040	
v/s Ratio Prot					c0.03			0.18			c0.21	
v/s Ratio Perm						0.02	0.12					
v/c Ratio					0.17	0.09	0.20	0.31			0.36	
Uniform Delay, d1					12.3	12.2	3.4	3.6			3.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.0	0.1	0.1	0.0			0.0	
Delay (s)					12.4	12.2	3.5	3.7			3.8	
Level of Service					B	B	A	A			A	
Approach Delay (s)		0.0			12.3			3.6			3.8	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			4.9		HCM Level of Service						A	
HCM Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			34.9		Sum of lost time (s)						8.4	
Intersection Capacity Utilization			52.0%		ICU Level of Service						A	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Ventura Ave & S 1st St

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	297	4	12	398	153	6	142	5	130	103	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3533		1770	3539	1583	1770	3520		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.67	1.00		0.63	1.00	1.00
Satd. Flow (perm)	1770	3533		1770	3539	1583	1255	3520		1171	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.75	0.75	0.75	0.79	0.79	0.79
Adj. Flow (vph)	73	323	4	15	491	189	8	189	7	165	130	81
RTOR Reduction (vph)	0	0	0	0	0	90	0	3	0	0	0	63
Lane Group Flow (vph)	73	327	0	15	491	99	8	193	0	165	130	18
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	4.4	30.8		1.0	27.4	27.4	12.9	12.9		12.9	12.9	12.9
Effective Green, g (s)	4.4	30.8		1.0	27.4	27.4	12.9	12.9		12.9	12.9	12.9
Actuated g/C Ratio	0.08	0.53		0.02	0.47	0.47	0.22	0.22		0.22	0.22	0.22
Clearance Time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	135	1879		31	1675	749	280	784		261	415	353
v/s Ratio Prot	c0.04	c0.09		0.01	c0.14			0.05			0.07	
v/s Ratio Perm						0.06	0.01			c0.14		0.01
v/c Ratio	0.54	0.17		0.48	0.29	0.13	0.03	0.25		0.63	0.31	0.05
Uniform Delay, d1	25.8	7.0		28.2	9.3	8.6	17.6	18.5		20.4	18.8	17.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	0.0		4.3	0.0	0.0	0.0	0.1		3.6	0.2	0.0
iDelay (s)	28.1	7.0		32.5	9.4	8.6	17.6	18.6		24.0	19.0	17.7
Level of Service	C	A		C	A	A	B	B		C	B	B
Approach Delay (s)		10.9			9.7			18.5			20.9	
Approach LOS		B			A			B			C	























Intersection Summary

HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	17.8
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

14: Ventura Ave & S 1st St

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	519	7	21	396	255	10	217	16	188	165	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3533		1770	3539	1583	1770	3502		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00		0.59	1.00	1.00
Satd. Flow (perm)	1770	3533		1770	3539	1583	1127	3502		1105	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.77	0.77	0.77	0.91	0.91	0.91	0.89	0.89	0.89
Adj. Flow (vph)	127	552	7	27	514	331	11	238	18	211	185	115
RTOR Reduction (vph)	0	1	0	0	0	167	0	6	0	0	0	84
Lane Group Flow (vph)	127	559	0	27	514	164	11	250	0	211	185	31
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	7.8	33.4		2.3	27.9	27.9	17.9	17.9		17.9	17.9	17.9
Effective Green, g (s)	7.8	33.4		2.3	27.9	27.9	17.9	17.9		17.9	17.9	17.9
Actuated g/C Ratio	0.12	0.50		0.03	0.42	0.42	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	207	1767		61	1478	661	302	938		296	499	424
v/s Ratio Prot	c0.07	0.16		0.02	c0.15			0.07			0.10	
v/s Ratio Perm						0.10	0.01			c0.19		0.02
v/c Ratio	0.61	0.32		0.44	0.35	0.25	0.04	0.27		0.71	0.37	0.07
Uniform Delay, d1	28.1	9.9		31.6	13.3	12.6	18.1	19.3		22.1	19.9	18.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	0.0		1.9	0.1	0.1	0.0	0.1		6.6	0.2	0.0
Delay (s)	31.8	10.0		33.5	13.3	12.7	18.1	19.3		28.7	20.0	18.3
Level of Service	C	A		C	B	B	B	B		C	C	B
Approach Delay (s)		14.0			13.7			19.3			23.2	
Approach LOS		B			B			B			C	










Intersection Summary

HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	13.2
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

15: G St & Inyo St










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	116	0	7	180	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.89	0.89	0.56	0.56
Hourly flow rate (vph)	129	0	8	202	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	484			1038		
pX, platoon unblocked						
vC, conflicting volume			129		347	129
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		347	129
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1457		646	921
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	129	210	16			
Volume Left	0	8	9			
Volume Right	0	0	7			
cSH	1700	1457	745			
Volume to Capacity	0.08	0.01	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.3	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.3	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			25.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

15: G St & Inyo St




















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Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	157	0	4	170	4	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.89	0.89	0.40	0.40
Hourly flow rate (vph)	174	0	4	191	10	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	484			1038		
pX, platoon unblocked						
vC, conflicting volume			174		374	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			174		374	174
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1402		625	869
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	174	196	20			
Volume Left	0	4	10			
Volume Right	0	0	10			
cSH	1700	1402	727			
Volume to Capacity	0.10	0.00	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.2	10.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			22.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

16: H St & Inyo St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	98	102	0	0	174	14	0	27	0	5	63	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	15	15	12	12	15	15	15	12	15	12
Total Lost time (s)	4.0	4.2			4.2	4.2		4.2			4.0	4.2
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00			1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.99	1.00
Satd. Flow (prot)	1770	1863			1863	1583		2049			2038	1583
Flt Permitted	0.95	1.00			1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1770	1863			1863	1583		2049			2049	1583
Peak-hour factor, PHF	0.80	0.80	0.92	0.92	0.80	0.80	0.92	0.92	0.92	0.59	0.92	0.59
Adj. Flow (vph)	122	128	0	0	218	18	0	29	0	8	68	300
RTOR Reduction (vph)	0	0	0	0	0	14	0	0	0	0	0	200
Lane Group Flow (vph)	122	128	0	0	218	4	0	29	0	0	76	100
Turn Type	Prot					Perm	Perm			Prot		custom
Protected Phases	5	2			6			4!		4!	8	
Permitted Phases						6	4					4
Actuated Green, G (s)	6.7	20.4			9.7	9.7		14.5			14.7	14.5
Effective Green, g (s)	6.7	20.4			9.7	9.7		14.5			14.7	14.5
Actuated g/C Ratio	0.15	0.47			0.22	0.22		0.33			0.34	0.33
Clearance Time (s)	4.0	4.2			4.2	4.2		4.2			4.0	4.2
Vehicle Extension (s)	3.0	4.8			4.8	4.8		2.0			3.0	2.0
Lane Grp Cap (vph)	274	878			417	355		686			696	530
v/s Ratio Prot	c0.07	0.07			c0.12			0.01			0.04	
v/s Ratio Perm						0.00					0.00	c0.06
v/c Ratio	0.45	0.15			0.52	0.01		0.04			0.11	0.19
Uniform Delay, d1	16.6	6.5			14.8	13.1		9.7			9.8	10.2
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	1.2	0.1			2.1	0.0		0.0			0.1	0.1
Delay (s)	17.8	6.7			16.9	13.1		9.7			9.9	10.3
Level of Service	B	A			B	B		A			A	B
Approach Delay (s)		12.1			16.6			9.7			10.2	
Approach LOS		B			B			A			B	

Intersection Summary

HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	43.3	Sum of lost time (s)	12.4
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		




















! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

16: H St & Inyo St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	96	164	0	0	75	5	0	63	0	10	27	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	15	15	12	12	15	15	15	12	15	12
Total Lost time (s)	4.0	4.2			4.2	4.2		4.2			4.0	4.2
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00			1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.98	1.00
Satd. Flow (prot)	1770	1863			1863	1583		2049			2011	1583
Flt Permitted	0.95	1.00			1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1770	1863			1863	1583		2049			2049	1583
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.83	0.83	0.92	0.92	0.92	0.57	0.92	0.57
Adj. Flow (vph)	109	186	0	0	90	6	0	68	0	18	29	223
RTOR Reduction (vph)	0	0	0	0	0	5	0	0	0	0	0	158
Lane Group Flow (vph)	109	186	0	0	90	1	0	68	0	0	47	65
Turn Type	Prot					Perm	Perm			Prot		custom
Protected Phases	5	2			6			4!		4!	8	
Permitted Phases						6	4					4
Actuated Green, G (s)	4.3	15.6			7.3	7.3		9.8			10.0	9.8
Effective Green, g (s)	4.3	15.6			7.3	7.3		9.8			10.0	9.8
Actuated g/C Ratio	0.13	0.46			0.22	0.22		0.29			0.30	0.29
Clearance Time (s)	4.0	4.2			4.2	4.2		4.2			4.0	4.2
Vehicle Extension (s)	3.0	4.8			4.8	4.8		2.0			3.0	2.0
Lane Grp Cap (vph)	225	860			402	342		594			606	459
v/s Ratio Prot	c0.06	c0.10			0.05			0.03			0.02	
v/s Ratio Perm						0.00					0.00	c0.04
v/c Ratio	0.48	0.22			0.22	0.00		0.11			0.08	0.14
Uniform Delay, d1	13.7	5.4			10.9	10.4		8.8			8.6	8.9
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	1.6	0.2			0.6	0.0		0.0			0.1	0.1
Delay (s)	15.4	5.7			11.5	10.4		8.8			8.6	8.9
Level of Service	B	A			B	B		A			A	A
Approach Delay (s)		9.3			11.4			8.8			8.9	
Approach LOS		A			B			A			A	

Intersection Summary

HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	33.8	Sum of lost time (s)	12.4
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		






















! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

17: Van Ness Ave & Inyo St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	5	102	43	95	455	54	34	53	33	6	28	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1833		1770	1756		1770	1762	
Flt Permitted	0.33	1.00	1.00	0.67	1.00		0.72	1.00		0.68	1.00	
Satd. Flow (perm)	623	1863	1583	1253	1833		1332	1756		1269	1762	
Peak-hour factor, PHF	0.77	0.77	0.77	0.89	0.89	0.89	0.73	0.73	0.73	0.69	0.69	0.69
Adj. Flow (vph)	6	132	56	107	511	61	47	73	45	9	41	23
RTOR Reduction (vph)	0	0	26	0	6	0	0	31	0	0	16	0
Lane Group Flow (vph)	6	132	30	107	566	0	47	87	0	9	48	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	28.1	28.1	28.1	28.1	28.1		16.0	16.0		16.0	16.0	
Effective Green, g (s)	28.1	28.1	28.1	28.1	28.1		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54		0.30	0.30		0.30	0.30	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	333	997	847	671	981		406	535		387	537	
v/s Ratio Prot		0.07			0.31			0.05			0.03	
v/s Ratio Perm	0.01		0.02	0.09			0.04			0.01		
v/c Ratio	0.02	0.13	0.04	0.16	0.58		0.12	0.16		0.02	0.09	
Uniform Delay, d1	5.7	6.1	5.8	6.2	8.2		13.2	13.3		12.8	13.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0	0.0	0.0	0.5		0.0	0.1		0.0	0.0	
Delay (s)	5.7	6.1	5.8	6.2	8.7		13.2	13.4		12.8	13.1	
Level of Service	A	A	A	A	A		B	B		B	B	
Approach Delay (s)		6.0			8.3			13.3			13.0	
Approach LOS		A			A			B			B	






















Intersection Summary

HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	8.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

17: Van Ness Ave & Inyo St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	9	197	51	68	300	22	77	39	96	20	60	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1843		1770	1664		1770	1756	
Flt Permitted	0.48	1.00	1.00	0.62	1.00		0.67	1.00		0.66	1.00	
Satd. Flow (perm)	895	1863	1583	1161	1843		1252	1664		1221	1756	
Peak-hour factor, PHF	0.91	0.91	0.91	0.86	0.86	0.86	0.84	0.84	0.84	0.73	0.73	0.73
Adj. Flow (vph)	10	216	56	79	349	26	92	46	114	27	82	51
RTOR Reduction (vph)	0	0	31	0	5	0	0	73	0	0	32	0
Lane Group Flow (vph)	10	216	25	79	370	0	92	87	0	27	101	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	17.4	17.4	17.4	17.4	17.4		14.7	14.7		14.7	14.7	
Effective Green, g (s)	17.4	17.4	17.4	17.4	17.4		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	385	800	680	499	792		454	604		443	637	
v/s Ratio Prot		0.12			c0.20			0.05			0.06	
v/s Ratio Perm	0.01		0.02	0.07			c0.07			0.02		
v/c Ratio	0.03	0.27	0.04	0.16	0.47		0.20	0.14		0.06	0.16	
Uniform Delay, d1	6.7	7.5	6.7	7.1	8.2		8.9	8.7		8.4	8.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.0	0.1	0.2		0.1	0.0		0.0	0.0	
Delay (s)	6.7	7.5	6.7	7.1	8.4		9.0	8.7		8.4	8.8	
Level of Service	A	A	A	A	A		A	A		A	A	
Approach Delay (s)		7.3			8.2			8.8			8.7	
Approach LOS		A			A			A			A	

















Intersection Summary

HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	8.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

18: M St & Inyo St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	36	157	46	0	0	0	0	50	18	6	37	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5						4.5		4.5	4.5	
Lane Util. Factor		0.91						1.00		1.00	1.00	
Frt		0.97						0.96		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		4901						1797		1770	1863	
Flt Permitted		0.99						1.00		0.70	1.00	
Satd. Flow (perm)		4901						1797		1295	1863	
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.71	0.71	0.71	0.90	0.90	0.90
Adj. Flow (vph)	47	204	60	0	0	0	0	70	25	7	41	0
RTOR Reduction (vph)	0	40	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	0	271	0	0	0	0	0	79	0	7	41	0
Turn Type	Split									Perm		
Protected Phases	2	2						8			4	
Permitted Phases										4		
Actuated Green, G (s)		9.7						9.7		9.7	9.7	
Effective Green, g (s)		9.7						9.7		9.7	9.7	
Actuated g/C Ratio		0.34						0.34		0.34	0.34	
Clearance Time (s)		4.5						4.5		4.5	4.5	
Vehicle Extension (s)		0.2						0.2		0.2	0.2	
Lane Grp Cap (vph)		1674						614		442	636	
v/s Ratio Prot		c0.06						c0.04			0.02	
v/s Ratio Perm										0.01		
v/c Ratio		0.16						0.13		0.02	0.06	
Uniform Delay, d1		6.5						6.4		6.2	6.3	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.0						0.0		0.0	0.0	
Delay (s)		6.5						6.5		6.2	6.3	
Level of Service		A						A		A	A	
Approach Delay (s)		6.5			0.0			6.5			6.3	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.5		HCM Level of Service					A		
HCM Volume to Capacity ratio			0.15									
Actuated Cycle Length (s)			28.4							9.0		
Intersection Capacity Utilization			68.8%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: M St & Inyo St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	18	390	23	0	0	0	0	53	92	38	59	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5						4.5		4.5	4.5	
Lane Util. Factor		0.91						1.00		1.00	1.00	
Frt		0.99						0.91		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		5035						1704		1770	1863	
Flt Permitted		1.00						1.00		0.63	1.00	
Satd. Flow (perm)		5035						1704		1182	1863	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.74	0.74	0.74	0.71	0.71	0.71
Adj. Flow (vph)	21	464	27	0	0	0	0	72	124	54	83	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	76	0	0	0	0
Lane Group Flow (vph)	0	500	0	0	0	0	0	120	0	54	83	0
Turn Type	Split									Perm		
Protected Phases	2	2						8			4	
Permitted Phases										4		
Actuated Green, G (s)		15.4						15.4		15.4	15.4	
Effective Green, g (s)		15.4						15.4		15.4	15.4	
Actuated g/C Ratio		0.39						0.39		0.39	0.39	
Clearance Time (s)		4.5						4.5		4.5	4.5	
Vehicle Extension (s)		0.2						0.2		0.2	0.2	
Lane Grp Cap (vph)		1948						659		457	721	
v/s Ratio Prot		c0.10						c0.07			0.04	
v/s Ratio Perm										0.05		
v/c Ratio		0.26						0.18		0.12	0.12	
Uniform Delay, d1		8.3						8.0		7.8	7.8	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.0						0.0		0.0	0.0	
Delay (s)		8.3						8.1		7.9	7.9	
Level of Service		A						A		A	A	
Approach Delay (s)		8.3			0.0			8.1			7.9	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			8.2							A		
HCM Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			39.8							9.0		
Intersection Capacity Utilization			68.8%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

19: P St & Inyo St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	26	210	7	14	8	0	0	8	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.79	0.79	0.79	0.42	0.42	0.42
Hourly flow rate (vph)	0	0	0	32	256	9	18	10	0	0	19	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1000			1010							
pX, platoon unblocked												
vC, conflicting volume	265			0			218	328	0	329	324	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			0			218	328	0	329	324	132
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			97	98	100	100	97	98
cM capacity (veh/h)	1296			1622			678	578	1084	584	581	893
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	SW 1							
Volume Total	160	137	18	10	36							
Volume Left	32	0	18	0	0							
Volume Right	0	9	0	0	17							
cSH	1622	1700	678	578	694							
Volume to Capacity	0.02	0.08	0.03	0.02	0.05							
Queue Length 95th (ft)	1	0	2	1	4							
Control Delay (s)	1.6	0.0	10.4	11.3	10.5							
Lane LOS	A		B	B	B							
Approach Delay (s)	0.8		10.8		10.5							
Approach LOS			B		B							
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			68.8%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

19: P St & Inyo St










4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	27	203	17	63	19	0	0	5	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.76	0.76	0.76	0.45	0.45	0.45
Hourly flow rate (vph)	0	0	0	35	260	22	83	25	0	0	11	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1000			1010							
pX, platoon unblocked												
vC, conflicting volume	282			0			214	351	0	353	340	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282			0			214	351	0	353	340	141
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			88	96	100	100	98	99
cM capacity (veh/h)	1277			1622			695	560	1084	549	568	881
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	SW 1							
Volume Total	165	152	83	25	20							
Volume Left	35	0	83	0	0							
Volume Right	0	22	0	0	9							
cSH	1622	1700	695	560	674							
Volume to Capacity	0.02	0.09	0.12	0.04	0.03							
Queue Length 95th (ft)	2	0	10	3	2							
Control Delay (s)	1.7	0.0	10.9	11.7	10.5							
Lane LOS	A		B	B	B							
Approach Delay (s)	0.9		11.1		10.5							
Approach LOS			B		B							
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			68.8%			ICU Level of Service				C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

20: G St & Kern St







4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	102	8	12	154	2	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.8			4.8	4.8	
Lane Util. Factor	0.95			0.95	1.00	
Frt	0.99			1.00	0.89	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	3502			3527	1637	
Flt Permitted	1.00			0.93	0.99	
Satd. Flow (perm)	3502			3274	1637	
Peak-hour factor, PHF	0.78	0.78	0.84	0.84	0.88	0.88
Adj. Flow (vph)	131	10	14	183	2	11
RTOR Reduction (vph)	8	0	0	0	10	0
Lane Group Flow (vph)	133	0	0	197	3	0
Turn Type			Perm			
Protected Phases	2			2		
Permitted Phases			2		4	
Actuated Green, G (s)	2.8			2.8	0.6	
Effective Green, g (s)	2.8			2.8	0.6	
Actuated g/C Ratio	0.22			0.22	0.05	
Clearance Time (s)	4.8			4.8	4.8	
Vehicle Extension (s)	0.2			0.2	0.2	
Lane Grp Cap (vph)	754			705	76	
v/s Ratio Prot	0.04					
v/s Ratio Perm				c0.06	c0.00	
v/c Ratio	0.18			0.28	0.03	
Uniform Delay, d1	4.2			4.3	5.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.0			0.1	0.1	
Delay (s)	4.2			4.3	6.0	
Level of Service	A			A	A	
Approach Delay (s)	4.2			4.3	6.0	
Approach LOS	A			A	A	
Intersection Summary						
HCM Average Control Delay			4.3	HCM Level of Service		A
HCM Volume to Capacity ratio			0.24			
Actuated Cycle Length (s)			13.0	Sum of lost time (s)		9.6
Intersection Capacity Utilization			19.3%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

20: G St & Kern St










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	126	15	17	157	23	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.8			4.8	4.8	
Lane Util. Factor	0.95			0.95	1.00	
Frt	0.98			1.00	0.93	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3484			3522	1696	
Flt Permitted	1.00			0.91	0.98	
Satd. Flow (perm)	3484			3230	1696	
Peak-hour factor, PHF	0.87	0.87	0.85	0.85	0.72	0.72
Adj. Flow (vph)	145	17	20	185	32	31
RTOR Reduction (vph)	13	0	0	0	30	0
Lane Group Flow (vph)	149	0	0	205	33	0
Turn Type			Perm			
Protected Phases	2			2		
Permitted Phases			2		4	
Actuated Green, G (s)	2.8			2.8	0.6	
Effective Green, g (s)	2.8			2.8	0.6	
Actuated g/C Ratio	0.22			0.22	0.05	
Clearance Time (s)	4.8			4.8	4.8	
Vehicle Extension (s)	0.2			0.2	0.2	
Lane Grp Cap (vph)	750			696	78	
v/s Ratio Prot	0.04					
v/s Ratio Perm				c0.06	c0.02	
v/c Ratio	0.20			0.29	0.43	
Uniform Delay, d1	4.2			4.3	6.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.0			0.1	1.4	
Delay (s)	4.2			4.4	7.4	
Level of Service	A			A	A	
Approach Delay (s)	4.2			4.4	7.4	
Approach LOS	A			A	A	
Intersection Summary						
HCM Average Control Delay			4.8		HCM Level of Service	A
HCM Volume to Capacity ratio			0.32			
Actuated Cycle Length (s)			13.0		Sum of lost time (s)	9.6
Intersection Capacity Utilization			24.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis

21: H St & Kern St










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	171	67	158	162	11	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.86	0.86	0.70	0.70
Hourly flow rate (vph)	216	85	184	188	16	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	537			471		
pX, platoon unblocked						
vC, conflicting volume			301		815	259
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			301		815	259
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		95	97
cM capacity (veh/h)			1260		297	780
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	301	372	40			
Volume Left	0	184	16			
Volume Right	85	0	24			
cSH	1700	1260	475			
Volume to Capacity	0.18	0.15	0.08			
Queue Length 95th (ft)	0	13	7			
Control Delay (s)	0.0	4.8	13.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	4.8	13.3			
Approach LOS			B			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			43.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

21: H St & Kern St



















4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	177	16	22	166	38	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.75	0.75	0.74	0.74
Hourly flow rate (vph)	201	18	29	221	51	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	537			471		
pX, platoon unblocked						
vC, conflicting volume			219		490	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			219		490	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		90	91
cM capacity (veh/h)			1350		526	830
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	219	251	124			
Volume Left	0	29	51			
Volume Right	18	0	73			
cSH	1700	1350	670			
Volume to Capacity	0.13	0.02	0.19			
Queue Length 95th (ft)	0	2	17			
Control Delay (s)	0.0	1.1	11.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.1	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			35.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

22: E St & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	19	44	5	3	38	6	9	76	4	3	61	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.98		1.00	0.99		1.00	0.96	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1820			1826		1770	1848		1770	1790	
Flt Permitted		0.92			0.99		0.69	1.00		0.70	1.00	
Satd. Flow (perm)		1706			1806		1290	1848		1295	1790	
Peak-hour factor, PHF	0.93	0.93	0.93	0.73	0.73	0.73	0.84	0.84	0.84	0.82	0.82	0.82
Adj. Flow (vph)	20	47	5	4	52	8	11	90	5	4	74	26
RTOR Reduction (vph)	0	4	0	0	6	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	68	0	0	58	0	11	93	0	4	89	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		11.7			11.7		21.4	21.4		21.4	21.4	
Effective Green, g (s)		11.7			11.7		21.4	21.4		21.4	21.4	
Actuated g/C Ratio		0.28			0.28		0.52	0.52		0.52	0.52	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		481			509		665	953		668	923	
v/s Ratio Prot								0.05			0.05	
v/s Ratio Perm		0.04			0.03		0.01			0.00		
v/c Ratio		0.14			0.11		0.02	0.10		0.01	0.10	
Uniform Delay, d1		11.1			11.1		4.9	5.1		4.9	5.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0	0.0		0.0	0.0	
Delay (s)		11.2			11.1		4.9	5.1		4.9	5.1	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		11.2			11.1			5.1			5.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			7.5			HCM Level of Service					A	
HCM Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			41.5						8.4			
Intersection Capacity Utilization			47.0%						A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: E St & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	21	74	19	8	63	10	14	71	14	25	140	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.98		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805			1822		1770	1817		1770	1817	
Flt Permitted		0.94			0.97		0.63	1.00		0.69	1.00	
Satd. Flow (perm)		1713			1775		1175	1817		1285	1817	
Peak-hour factor, PHF	0.93	0.93	0.93	0.84	0.84	0.84	0.82	0.82	0.82	0.83	0.83	0.83
Adj. Flow (vph)	23	80	20	10	75	12	17	87	17	30	169	33
RTOR Reduction (vph)	0	11	0	0	8	0	0	6	0	0	6	0
Lane Group Flow (vph)	0	112	0	0	89	0	17	98	0	30	196	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		11.7			11.7		21.3	21.3		21.3	21.3	
Effective Green, g (s)		11.7			11.7		21.3	21.3		21.3	21.3	
Actuated g/C Ratio		0.28			0.28		0.51	0.51		0.51	0.51	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		484			502		605	935		661	935	
v/s Ratio Prot								0.05			c0.11	
v/s Ratio Perm		c0.07			0.05		0.01			0.02		
v/c Ratio		0.23			0.18		0.03	0.10		0.05	0.21	
Uniform Delay, d1		11.4			11.2		5.0	5.2		5.0	5.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.1		0.0	0.0		0.0	0.0	
Delay (s)		11.5			11.3		5.0	5.2		5.0	5.5	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		11.5			11.3			5.1			5.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			7.7			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			41.4			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			47.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: F st & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	7	29	2	2	13	9	3	90	8	11	84	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.99		1.00	0.97	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1834			1760		1770	1840		1770	1813	
Flt Permitted		0.95			0.97		0.68	1.00		0.68	1.00	
Satd. Flow (perm)		1751			1721		1263	1840		1276	1813	
Peak-hour factor, PHF	0.59	0.59	0.59	0.75	0.75	0.75	0.87	0.87	0.87	0.83	0.83	0.83
Adj. Flow (vph)	12	49	3	3	17	12	3	103	9	13	101	22
RTOR Reduction (vph)	0	2	0	0	9	0	0	5	0	0	12	0
Lane Group Flow (vph)	0	62	0	0	23	0	3	107	0	13	111	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		7.6			7.6		14.0	14.0		14.0	14.0	
Effective Green, g (s)		7.6			7.6		14.0	14.0		14.0	14.0	
Actuated g/C Ratio		0.25			0.25		0.47	0.47		0.47	0.47	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		444			436		589	859		595	846	
v/s Ratio Prot								0.06			c0.06	
v/s Ratio Perm		c0.04			0.01		0.00			0.01		
v/c Ratio		0.14			0.05		0.01	0.12		0.02	0.13	
Uniform Delay, d1		8.7			8.5		4.3	4.5		4.3	4.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.0		0.0	0.0	
Delay (s)		8.7			8.5		4.3	4.6		4.3	4.6	
Level of Service		A			A		A	A		A	A	
Approach Delay (s)		8.7			8.5			4.5			4.5	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			5.7			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.13									
Actuated Cycle Length (s)			30.0			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			49.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: F st & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	11	46	16	4	41	17	4	72	12	17	151	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.96		1.00	0.98		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794			1787		1770	1823		1770	1818	
Flt Permitted		0.96			0.99		0.63	1.00		0.69	1.00	
Satd. Flow (perm)		1736			1768		1167	1823		1291	1818	
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.85	0.85	0.85	0.86	0.86	0.86
Adj. Flow (vph)	14	58	20	4	45	19	5	85	14	20	176	34
RTOR Reduction (vph)	0	14	0	0	14	0	0	7	0	0	12	0
Lane Group Flow (vph)	0	78	0	0	54	0	5	92	0	20	198	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		12.4			12.4		22.7	22.7		22.7	22.7	
Effective Green, g (s)		12.4			12.4		22.7	22.7		22.7	22.7	
Actuated g/C Ratio		0.29			0.29		0.52	0.52		0.52	0.52	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		495			504		609	951		674	949	
v/s Ratio Prot								0.05			c0.11	
v/s Ratio Perm		c0.04			0.03		0.00			0.02		
v/c Ratio		0.16			0.11		0.01	0.10		0.03	0.21	
Uniform Delay, d1		11.6			11.5		5.0	5.2		5.1	5.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.0		0.0	0.0	
Delay (s)		11.7			11.5		5.0	5.3		5.1	5.6	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		11.7			11.5			5.2			5.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			7.5			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.19									
Actuated Cycle Length (s)			43.5			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			49.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: G St & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	17	100	7	6	114	45	13	85	12	21	91	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.96		1.00	0.98		1.00	0.95	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3485			3388		1770	1828		1770	1761	
Flt Permitted		0.91			0.95		0.66	1.00		0.68	1.00	
Satd. Flow (perm)		3211			3217		1234	1828		1275	1761	
Peak-hour factor, PHF	0.78	0.78	0.78	0.83	0.83	0.83	0.86	0.86	0.86	0.96	0.96	0.96
Adj. Flow (vph)	22	128	9	7	137	54	15	99	14	22	95	54
RTOR Reduction (vph)	0	5	0	0	28	0	0	8	0	0	32	0
Lane Group Flow (vph)	0	154	0	0	170	0	15	105	0	22	117	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		20.5			20.5		13.0	13.0		13.0	13.0	
Effective Green, g (s)		20.5			20.5		13.0	13.0		13.0	13.0	
Actuated g/C Ratio		0.49			0.49		0.31	0.31		0.31	0.31	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1571			1574		383	567		396	546	
v/s Ratio Prot								0.06			c0.07	
v/s Ratio Perm		0.05			c0.05		0.01			0.02		
v/c Ratio		0.10			0.11		0.04	0.18		0.06	0.21	
Uniform Delay, d1		5.7			5.8		10.1	10.6		10.1	10.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0	0.1		0.0	0.1	
Delay (s)		5.8			5.8		10.1	10.6		10.2	10.8	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		5.8			5.8			10.6			10.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			8.0			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.15									
Actuated Cycle Length (s)			41.9			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			47.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: G St & Tulare St






















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	18	83	6	18	149	22	8	83	21	41	184	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.98		1.00	0.97		1.00	0.94	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3479			3461		1770	1805		1770	1758	
Flt Permitted		0.91			0.93		0.37	1.00		0.68	1.00	
Satd. Flow (perm)		3175			3237		688	1805		1276	1758	
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.93	0.93	0.93	0.78	0.78	0.78
Adj. Flow (vph)	23	105	8	20	164	24	9	89	23	53	236	142
RTOR Reduction (vph)	0	4	0	0	12	0	0	14	0	0	33	0
Lane Group Flow (vph)	0	132	0	0	197	0	9	98	0	53	345	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		30.0			30.0		19.2	19.2		19.2	19.2	
Effective Green, g (s)		30.0			30.0		19.2	19.2		19.2	19.2	
Actuated g/C Ratio		0.52			0.52		0.33	0.33		0.33	0.33	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1654			1686		229	602		425	586	
v/s Ratio Prot								0.05			c0.20	
v/s Ratio Perm		0.04			c0.06		0.01			0.04		
v/c Ratio		0.08			0.12		0.04	0.16		0.12	0.59	
Uniform Delay, d1		6.9			7.0		13.0	13.5		13.4	15.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0	0.0		0.0	1.0	
Delay (s)		6.9			7.1		13.0	13.6		13.4	16.9	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		6.9			7.1			13.5			16.5	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			12.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			57.6			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			48.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: H St & Tulare St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	200	273	17	49	138	67	31	98	21	139	110	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1772		1770	3445		1770	3324	
Flt Permitted	0.60	1.00	1.00	0.45	1.00		0.61	1.00		0.66	1.00	
Satd. Flow (perm)	1111	1863	1583	831	1772		1144	3445		1228	3324	
Peak-hour factor, PHF	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.84	0.84	0.84
Adj. Flow (vph)	270	369	23	56	159	77	38	120	26	165	131	89
RTOR Reduction (vph)	0	0	14	0	28	0	0	15	0	0	50	0
Lane Group Flow (vph)	270	369	9	56	208	0	38	131	0	165	170	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	23.7	23.7	23.7	23.7	23.7		25.0	25.0		25.0	25.0	
Effective Green, g (s)	23.7	23.7	23.7	23.7	23.7		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41		0.44	0.44		0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	459	769	654	343	732		498	1500		535	1448	
v/s Ratio Prot		0.20			0.12			0.04			0.05	
v/s Ratio Perm	c0.24		0.01	0.07			0.03			c0.13		
v/c Ratio	0.59	0.48	0.01	0.16	0.28		0.08	0.09		0.31	0.12	
Uniform Delay, d1	13.1	12.3	10.0	10.6	11.2		9.5	9.5		10.6	9.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.2	0.0	0.1	0.1		0.0	0.0		0.1	0.0	
Delay (s)	14.3	12.5	10.0	10.7	11.3		9.5	9.5		10.7	9.6	
Level of Service	B	B	A	B	B		A	A		B	A	
Approach Delay (s)		13.2			11.2			9.5			10.1	
Approach LOS		B			B			A			B	






















Intersection Summary

HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	8.7
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

25: H St & Tulare St





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	99	194	41	101	158	143	16	90	15	80	191	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1730		1770	3465		1770	3354	
Flt Permitted	0.41	1.00	1.00	0.61	1.00		0.55	1.00		0.67	1.00	
Satd. Flow (perm)	770	1863	1583	1133	1730		1029	3465		1257	3354	
Peak-hour factor, PHF	0.86	0.86	0.86	0.76	0.76	0.76	0.86	0.86	0.86	0.89	0.89	0.89
Adj. Flow (vph)	115	226	48	133	208	188	19	105	17	90	215	115
RTOR Reduction (vph)	0	0	29	0	53	0	0	10	0	0	64	0
Lane Group Flow (vph)	115	226	19	133	343	0	19	112	0	90	266	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases	2				6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	23.0	23.0	23.0	23.0	23.0		25.0	25.0		25.0	25.0	
Effective Green, g (s)	23.0	23.0	23.0	23.0	23.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41		0.44	0.44		0.44	0.44	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	312	756	642	460	702		454	1528		554	1479	
v/s Ratio Prot		0.12			c0.20			0.03			c0.08	
v/s Ratio Perm	0.15		0.01	0.12			0.02			0.07		
v/c Ratio	0.37	0.30	0.03	0.29	0.49		0.04	0.07		0.16	0.18	
Uniform Delay, d1	11.8	11.4	10.1	11.3	12.5		9.0	9.2		9.5	9.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1	0.0	0.1	0.2		0.0	0.0		0.1	0.0	
Delay (s)	12.0	11.5	10.1	11.5	12.7		9.0	9.2		9.6	9.6	
Level of Service	B	B	B	B	B		A	A		A	A	
Approach Delay (s)		11.5			12.4			9.1			9.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			11.1			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			56.7			Sum of lost time (s)				8.7		
Intersection Capacity Utilization			70.2%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: Van Ness Ave & Tulare St





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	85	108	107	49	385	59	95	234	21	67	209	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1724		1770	3469		1770	3496		1770	3312	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1724		1770	3469		1770	3496		1770	3312	
Peak-hour factor, PHF	0.96	0.96	0.96	0.89	0.89	0.89	0.74	0.74	0.74	0.74	0.74	0.74
Adj. Flow (vph)	89	112	111	55	433	66	128	316	28	91	282	211
RTOR Reduction (vph)	0	39	0	0	14	0	0	7	0	0	156	0
Lane Group Flow (vph)	89	184	0	55	485	0	128	337	0	91	337	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.2	21.9		4.0	19.7		7.1	16.4		6.3	15.6	
Effective Green, g (s)	6.2	21.9		4.0	19.7		7.1	16.4		6.3	15.6	
Actuated g/C Ratio	0.10	0.34		0.06	0.30		0.11	0.25		0.10	0.24	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	169	581		109	1051		193	882		172	795	
v/s Ratio Prot	c0.05	0.11		0.03	c0.14		c0.07	0.10		0.05	c0.10	
v/s Ratio Perm												
v/c Ratio	0.53	0.32		0.50	0.46		0.66	0.38		0.53	0.42	
Uniform Delay, d1	28.0	16.0		29.5	18.4		27.8	20.1		27.9	20.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.7		1.3	0.7		6.5	0.6		1.4	0.8	
Delay (s)	29.4	16.7		30.9	19.0		34.3	20.7		29.3	21.7	
Level of Service	C	B		C	B		C	C		C	C	
Approach Delay (s)		20.3			20.2			24.4			22.9	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			22.0			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)			16.4			
Intersection Capacity Utilization			46.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: Van Ness Ave & Tulare St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	82	178	72	58	365	55	102	232	21	51	227	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1782		1770	3470		1770	3496		1770	3320	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1782		1770	3470		1770	3496		1770	3320	
Peak-hour factor, PHF	0.94	0.94	0.94	0.87	0.87	0.87	0.86	0.86	0.86	0.78	0.78	0.78
Adj. Flow (vph)	87	189	77	67	420	63	119	270	24	65	291	204
RTOR Reduction (vph)	0	16	0	0	14	0	0	7	0	0	143	0
Lane Group Flow (vph)	87	250	0	67	469	0	119	287	0	65	352	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.2	21.0		4.3	19.1		6.9	19.2		4.2	16.5	
Effective Green, g (s)	6.2	21.0		4.3	19.1		6.9	19.2		4.2	16.5	
Actuated g/C Ratio	0.10	0.32		0.07	0.29		0.11	0.29		0.06	0.25	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	169	575		117	1018		188	1031		114	841	
v/s Ratio Prot	c0.05	c0.14		0.04	0.14		c0.07	c0.08		0.04	c0.11	
v/s Ratio Perm												
v/c Ratio	0.51	0.43		0.57	0.46		0.63	0.28		0.57	0.42	
Uniform Delay, d1	28.0	17.4		29.5	18.8		27.9	17.6		29.6	20.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.1		4.2	0.7		5.0	0.3		4.2	0.7	
Delay (s)	29.1	18.5		33.7	19.5		32.9	17.9		33.8	21.0	
Level of Service	C	B		C	B		C	B		C	C	
Approach Delay (s)		21.1			21.2			22.3			22.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			21.8			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			65.1			Sum of lost time (s)			16.4			
Intersection Capacity Utilization			47.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: M St & Tulare St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	129	183	180	0	0	0	0	303	58	77	627	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5	4.5					4.5		4.5	4.5	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.98		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		4982	1583					3454		1770	3539	
Flt Permitted		0.98	1.00					1.00		0.51	1.00	
Satd. Flow (perm)		4982	1583					3454		944	3539	
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.86	0.86	0.86	0.91	0.91	0.91
Adj. Flow (vph)	152	215	212	0	0	0	0	352	67	85	689	0
RTOR Reduction (vph)	0	0	108	0	0	0	0	29	0	0	0	0
Lane Group Flow (vph)	0	367	104	0	0	0	0	390	0	85	689	0
Turn Type	Split		Perm							Perm		
Protected Phases	2	2						4			4	
Permitted Phases			2							4		
Actuated Green, G (s)		19.0	19.0					26.0		26.0	26.0	
Effective Green, g (s)		19.0	19.0					26.0		26.0	26.0	
Actuated g/C Ratio		0.35	0.35					0.48		0.48	0.48	
Clearance Time (s)		4.5	4.5					4.5		4.5	4.5	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1753	557					1663		455	1704	
v/s Ratio Prot		c0.07						0.11			c0.19	
v/s Ratio Perm			0.07							0.09		
v/c Ratio		0.21	0.19					0.23		0.19	0.40	
Uniform Delay, d1		12.2	12.1					8.2		8.0	9.0	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.1					0.0		0.1	0.1	
Delay (s)		12.3	12.2					8.2		8.0	9.1	
Level of Service		B	B					A		A	A	
Approach Delay (s)		12.2			0.0			8.2			9.0	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			9.9								A	
HCM Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			54.0							9.0		
Intersection Capacity Utilization			70.4%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: M St & Tulare St




















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	154	265	104	0	0	0	0	494	41	66	424	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5	4.5					4.5		4.5	4.5	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.99		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		4994	1583					3498		1770	3539	
Flt Permitted		0.98	1.00					1.00		0.39	1.00	
Satd. Flow (perm)		4994	1583					3498		724	3539	
Peak-hour factor, PHF	0.59	0.59	0.59	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	261	449	176	0	0	0	0	574	48	69	446	0
RTOR Reduction (vph)	0	0	114	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	710	62	0	0	0	0	611	0	69	446	0
Turn Type	Split		Perm							Perm		
Protected Phases	2	2						4			4	
Permitted Phases			2							4		
Actuated Green, G (s)		19.0	19.0					26.0		26.0	26.0	
Effective Green, g (s)		19.0	19.0					26.0		26.0	26.0	
Actuated g/C Ratio		0.35	0.35					0.48		0.48	0.48	
Clearance Time (s)		4.5	4.5					4.5		4.5	4.5	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1757	557					1684		349	1704	
v/s Ratio Prot		c0.14						c0.17			0.13	
v/s Ratio Perm			0.04							0.10		
v/c Ratio		0.40	0.11					0.36		0.20	0.26	
Uniform Delay, d1		13.2	11.8					8.8		8.0	8.3	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0					0.0		0.1	0.0	
Delay (s)		13.3	11.8					8.8		8.1	8.3	
Level of Service		B	B					A		A	A	
Approach Delay (s)		13.0			0.0			8.8			8.3	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			10.5								B	
HCM Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			54.0							9.0		
Intersection Capacity Utilization			70.4%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: P St & Tulare St




















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	36	148	43	41	236	0	0	1032	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Lane Util. Factor				1.00	1.00	1.00	1.00	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	1863	1583	1770	3539			3539	1583
Flt Permitted				0.95	1.00	1.00	0.19	1.00			1.00	1.00
Satd. Flow (perm)				1770	1863	1583	358	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.83	0.83	0.83	0.80	0.80	0.80
Adj. Flow (vph)	0	0	0	44	180	52	49	284	0	0	1290	129
RTOR Reduction (vph)	0	0	0	0	0	42	0	0	0	0	0	55
Lane Group Flow (vph)	0	0	0	44	180	10	49	284	0	0	1290	74
Turn Type				Split		Perm	Perm					Perm
Protected Phases				6	6			8			4	
Permitted Phases						6	8					4
Actuated Green, G (s)				7.1	7.1	7.1	20.8	20.8			20.8	20.8
Effective Green, g (s)				7.1	7.1	7.1	20.8	20.8			20.8	20.8
Actuated g/C Ratio				0.20	0.20	0.20	0.57	0.57			0.57	0.57
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Vehicle Extension (s)				3.0	3.0	3.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)				346	364	310	205	2028			2028	907
v/s Ratio Prot				0.02	c0.10			0.08			c0.36	
v/s Ratio Perm						0.01	0.14					0.05
v/c Ratio				0.13	0.49	0.03	0.24	0.14			0.64	0.08
Uniform Delay, d1				12.0	13.0	11.8	3.8	3.6			5.2	3.5
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.2	1.1	0.0	1.3	0.1			0.9	0.1
Delay (s)				12.2	14.1	11.9	5.1	3.7			6.1	3.6
Level of Service				B	B	B	A	A			A	A
Approach Delay (s)		0.0			13.4			3.9			5.9	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			6.6								A	
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			36.3							8.4		
Intersection Capacity Utilization			70.4%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: P St & Tulare St























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	40	125	95	14	988	0	0	436	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Lane Util. Factor				1.00	1.00	1.00	1.00	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	1863	1583	1770	3539			3539	1583
Flt Permitted				0.95	1.00	1.00	0.45	1.00			1.00	1.00
Satd. Flow (perm)				1770	1863	1583	836	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.83	0.83	0.83	0.77	0.77	0.77	0.80	0.80	0.80
Adj. Flow (vph)	0	0	0	48	151	114	18	1283	0	0	545	38
RTOR Reduction (vph)	0	0	0	0	0	27	0	0	0	0	0	16
Lane Group Flow (vph)	0	0	0	48	151	87	18	1283	0	0	545	22
Turn Type				Split		Perm	Perm					Perm
Protected Phases				6	6			8			4	
Permitted Phases						6	8					4
Actuated Green, G (s)				6.8	6.8	6.8	20.8	20.8			20.8	20.8
Effective Green, g (s)				6.8	6.8	6.8	20.8	20.8			20.8	20.8
Actuated g/C Ratio				0.19	0.19	0.19	0.58	0.58			0.58	0.58
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Vehicle Extension (s)				3.0	3.0	3.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)				334	352	299	483	2045			2045	915
v/s Ratio Prot				0.03	c0.08			c0.36			0.15	
v/s Ratio Perm						0.06	0.02					0.01
v/c Ratio				0.14	0.43	0.29	0.04	0.63			0.27	0.02
Uniform Delay, d1				12.2	12.9	12.5	3.3	5.0			3.8	3.3
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.2	0.8	0.5	0.1	0.9			0.1	0.0
Delay (s)				12.4	13.7	13.1	3.3	5.9			3.9	3.3
Level of Service				B	B	B	A	A			A	A
Approach Delay (s)		0.0			13.3			5.9			3.9	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			6.4								A	
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			36.0							8.4		
Intersection Capacity Utilization			70.4%								C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: R Street & Tulare St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	37	156	43	63	210	81	31	221	20	90	1054	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3495		1770	3490	
Flt Permitted	0.53	1.00	1.00	0.62	1.00	1.00	0.13	1.00		0.59	1.00	
Satd. Flow (perm)	993	1863	1583	1147	1863	1583	247	3495		1096	3490	
Peak-hour factor, PHF	0.76	0.76	0.76	0.80	0.80	0.80	0.91	0.91	0.91	0.82	0.82	0.82
Adj. Flow (vph)	49	205	57	79	262	101	34	243	22	110	1285	130
RTOR Reduction (vph)	0	0	25	0	0	68	0	11	0	0	12	0
Lane Group Flow (vph)	49	205	32	79	262	33	34	254	0	110	1403	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	19.0	19.0	19.0	19.0	19.0	19.0	30.2	30.2		30.2	30.2	
Effective Green, g (s)	19.0	19.0	19.0	19.0	19.0	19.0	30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	325	610	519	376	610	519	129	1820		571	1817	
v/s Ratio Prot		0.11			c0.14			0.07			c0.40	
v/s Ratio Perm	0.05		0.02	0.07		0.02	0.14			0.10		
v/c Ratio	0.15	0.34	0.06	0.21	0.43	0.06	0.26	0.14		0.19	0.77	
Uniform Delay, d1	13.8	14.7	13.4	14.1	15.3	13.4	7.7	7.2		7.4	11.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.1	0.2	0.0	0.4	0.0		0.1	1.9	
Delay (s)	13.9	14.9	13.4	14.2	15.4	13.4	8.1	7.2		7.5	13.0	
Level of Service	B	B	B	B	B	B	A	A		A	B	
Approach Delay (s)		14.4			14.7			7.3			12.6	
Approach LOS		B			B			A			B	

























Intersection Summary

HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	103.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

29: R Street & Tulare St




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	113	225	33	47	193	103	32	942	63	60	361	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3506		1770	3479	
Flt Permitted	0.50	1.00	1.00	0.51	1.00	1.00	0.47	1.00		0.13	1.00	
Satd. Flow (perm)	925	1863	1583	951	1863	1583	874	3506		247	3479	
Peak-hour factor, PHF	0.81	0.81	0.81	0.67	0.67	0.67	0.78	0.78	0.78	0.84	0.84	0.84
Adj. Flow (vph)	140	278	41	70	288	154	41	1208	81	71	430	55
RTOR Reduction (vph)	0	0	28	0	0	31	0	8	0	0	16	0
Lane Group Flow (vph)	140	278	13	70	288	123	41	1281	0	71	469	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	19.0	19.0	19.0	19.0	19.0	19.0	30.2	30.2		30.2	30.2	
Effective Green, g (s)	19.0	19.0	19.0	19.0	19.0	19.0	30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	303	610	519	312	610	519	455	1826		129	1811	
v/s Ratio Prot		0.15			c0.15			c0.37			0.13	
v/s Ratio Perm	0.15		0.01	0.07		0.08	0.05			0.29		
v/c Ratio	0.46	0.46	0.03	0.22	0.47	0.24	0.09	0.70		0.55	0.26	
Uniform Delay, d1	15.5	15.4	13.2	14.2	15.5	14.2	7.0	10.5		9.3	7.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2	0.0	0.1	0.2	0.1	0.0	1.0		2.9	0.0	
Delay (s)	15.9	15.6	13.2	14.3	15.7	14.3	7.0	11.5		12.2	7.7	
Level of Service	B	B	B	B	B	B	A	B		B	A	
Approach Delay (s)		15.5			15.1			11.4			8.3	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			12.1									
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			58.0									
Intersection Capacity Utilization			92.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: U Street & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	30	79	38	0	0	0	21	307	42	169	1217	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	0.98		1.00	0.98	
Flt Protected		0.99	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1837	1583				1770	3475		1770	3478	
Flt Permitted		0.99	1.00				0.13	1.00		0.53	1.00	
Satd. Flow (perm)		1837	1583				243	3475		988	3478	
Peak-hour factor, PHF	0.74	0.74	0.74	0.92	0.92	0.92	0.94	0.94	0.94	0.87	0.87	0.87
Adj. Flow (vph)	41	107	51	0	0	0	22	327	45	194	1399	184
RTOR Reduction (vph)	0	0	16	0	0	0	0	10	0	0	10	0
Lane Group Flow (vph)	0	148	35	0	0	0	22	362	0	194	1573	0
Turn Type	Split		Perm				Perm			Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		6.3	6.3				30.6	30.6		30.6	30.6	
Effective Green, g (s)		6.3	6.3				30.6	30.6		30.6	30.6	
Actuated g/C Ratio		0.14	0.14				0.66	0.66		0.66	0.66	
Clearance Time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2				4.1	4.1		4.1	4.1	
Lane Grp Cap (vph)		251	216				161	2307		656	2309	
v/s Ratio Prot		c0.08						0.10			c0.45	
v/s Ratio Perm			0.02				0.09			0.20		
v/c Ratio		0.59	0.16				0.14	0.16		0.30	0.68	
Uniform Delay, d1		18.7	17.6				2.9	2.9		3.2	4.8	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3	0.1				0.6	0.0		0.4	0.9	
Delay (s)		21.0	17.7				3.4	3.0		3.6	5.7	
Level of Service		C	B				A	A		A	A	
Approach Delay (s)		20.1			0.0			3.0			5.5	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.3									
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			46.1									
Intersection Capacity Utilization			65.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: U Street & Tulare St










4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	75	136	20	0	0	0	23	965	83	140	564	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	0.99		1.00	0.98	
Flt Protected		0.98	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	1583				1770	3497		1770	3484	
Flt Permitted		0.98	1.00				0.39	1.00		0.13	1.00	
Satd. Flow (perm)		1830	1583				735	3497		244	3484	
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.72	0.72	0.72	0.95	0.95	0.95
Adj. Flow (vph)	107	194	29	0	0	0	32	1340	115	147	594	69
RTOR Reduction (vph)	0	0	20	0	0	0	0	7	0	0	11	0
Lane Group Flow (vph)	0	301	9	0	0	0	32	1448	0	147	652	0
Turn Type	Split		Perm				Perm			Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		11.5	11.5				30.5	30.5		30.5	30.5	
Effective Green, g (s)		11.5	11.5				30.5	30.5		30.5	30.5	
Actuated g/C Ratio		0.22	0.22				0.60	0.60		0.60	0.60	
Clearance Time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2				4.1	4.1		4.1	4.1	
Lane Grp Cap (vph)		411	356				438	2083		145	2075	
v/s Ratio Prot		c0.16						0.41			0.19	
v/s Ratio Perm			0.01				0.04			c0.60		
v/c Ratio		0.73	0.02				0.07	0.70		1.01	0.31	
Uniform Delay, d1		18.4	15.5				4.4	7.1		10.4	5.1	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.7	0.0				0.1	1.1		78.4	0.1	
Delay (s)		24.1	15.5				4.5	8.3		88.8	5.3	
Level of Service		C	B				A	A		F	A	
Approach Delay (s)		23.4			0.0			8.2			20.4	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM Average Control Delay			13.9				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			51.2				Sum of lost time (s)			9.2		
Intersection Capacity Utilization			60.5%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: Divisadero Connector & Tulare St










4/25/2011

						
Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	0	903	0	337	623	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.1		4.1	4.6	
Lane Util. Factor		0.88		0.95	0.95	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		2787		3539	3539	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		2787		3539	3539	
Peak-hour factor, PHF	0.85	0.85	0.89	0.89	0.77	0.77
Adj. Flow (vph)	0	1062	0	379	809	0
RTOR Reduction (vph)	0	547	0	0	0	0
Lane Group Flow (vph)	0	515	0	379	809	0
Turn Type	custom					
Protected Phases				6	4	
Permitted Phases	7					
Actuated Green, G (s)	18.2			11.1	17.7	
Effective Green, g (s)	18.2			11.1	17.7	
Actuated g/C Ratio	0.49			0.30	0.47	
Clearance Time (s)	4.1			4.1	4.6	
Vehicle Extension (s)	1.2			3.0	4.0	
Lane Grp Cap (vph)	1353			1048	1670	
v/s Ratio Prot				c0.11	c0.23	
v/s Ratio Perm	0.18					
v/c Ratio	0.38			0.36	0.48	
Uniform Delay, d1	6.1			10.4	6.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.1			0.2	0.3	
Delay (s)	6.2			10.6	7.1	
Level of Service	A			B	A	
Approach Delay (s)	6.2				10.6	7.1
Approach LOS	A				B	A
Intersection Summary						
HCM Average Control Delay	7.2			HCM Level of Service		A
HCM Volume to Capacity ratio	0.44					
Actuated Cycle Length (s)	37.5			Sum of lost time (s)		8.7
Intersection Capacity Utilization	56.1%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

31: Divisadero Connector & Tulare St


















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Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	0	313	0	1041	467	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.1		4.1	4.6	
Lane Util. Factor		0.88		0.95	0.95	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		2787		3539	3539	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		2787		3539	3539	
Peak-hour factor, PHF	0.91	0.91	0.72	0.72	0.92	0.92
Adj. Flow (vph)	0	344	0	1446	508	0
RTOR Reduction (vph)	0	234	0	0	0	0
Lane Group Flow (vph)	0	110	0	1446	508	0
Turn Type	custom					
Protected Phases				6	4	
Permitted Phases	7					
Actuated Green, G (s)	13.8			21.0	13.3	
Effective Green, g (s)	13.8			21.0	13.3	
Actuated g/C Ratio	0.32			0.49	0.31	
Clearance Time (s)	4.1			4.1	4.6	
Vehicle Extension (s)	1.2			3.0	4.0	
Lane Grp Cap (vph)	894			1728	1095	
v/s Ratio Prot				c0.41	c0.14	
v/s Ratio Perm	0.04					
v/c Ratio	0.12			0.84	0.46	
Uniform Delay, d1	10.3			9.5	12.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.0			3.7	0.4	
Delay (s)	10.3			13.2	12.4	
Level of Service	B			B	B	
Approach Delay (s)	10.3				13.2	12.4
Approach LOS	B				B	B
Intersection Summary						
HCM Average Control Delay	12.6			HCM Level of Service		B
HCM Volume to Capacity ratio	0.69					
Actuated Cycle Length (s)	43.0			Sum of lost time (s)		8.7
Intersection Capacity Utilization	32.2%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

32: E Divisadero St & 41 SB Off-Ramp













4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	500	5	0	289	0	0	0	0	434	920	819
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.91	0.91	1.00
Frt		1.00			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3534			3539					1610	3383	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3534			3539					1610	3383	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.72	0.72	0.72	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	581	6	0	401	0	0	0	0	477	1011	900
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	163
Lane Group Flow (vph)	0	585	0	0	401	0	0	0	0	429	1059	737
Turn Type										Perm		Perm
Protected Phases		4			8						2	
Permitted Phases										2		2
Actuated Green, G (s)		11.7			11.7					16.1	16.1	16.1
Effective Green, g (s)		11.7			11.7					16.1	16.1	16.1
Actuated g/C Ratio		0.33			0.33					0.45	0.45	0.45
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1155			1157					724	1521	712
v/s Ratio Prot		c0.17			0.11							
v/s Ratio Perm										0.27	0.31	c0.47
v/c Ratio		0.51			0.35					0.59	0.70	1.03
Uniform Delay, d1		9.7			9.1					7.4	7.9	9.8
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.4			0.2					1.3	1.4	42.9
Delay (s)		10.1			9.3					8.7	9.3	52.8
Level of Service		B			A					A	A	D
Approach Delay (s)		10.1			9.3			0.0			25.6	
Approach LOS		B			A			A			C	
Intersection Summary												
HCM Average Control Delay			21.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			35.8			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			65.4%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: E Divisadero St & 41 SB Off-Ramp







4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↑↑	↗
Volume (vph)	0	1004	9	0	254	0	0	0	0	543	308	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.91	0.91	1.00
Frt		1.00			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.98	1.00
Satd. Flow (prot)		3535			3539					1610	3314	1583
Flt Permitted		1.00			1.00					0.95	0.98	1.00
Satd. Flow (perm)		3535			3539					1610	3314	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.97	0.97	0.97	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	0	1128	10	0	262	0	0	0	0	560	318	319
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	200
Lane Group Flow (vph)	0	1136	0	0	262	0	0	0	0	286	592	119
Turn Type										Perm		Perm
Protected Phases		4			8						2	
Permitted Phases										2		2
Actuated Green, G (s)		15.5			15.5					14.0	14.0	14.0
Effective Green, g (s)		15.5			15.5					14.0	14.0	14.0
Actuated g/C Ratio		0.41			0.41					0.37	0.37	0.37
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1461			1463					601	1237	591
v/s Ratio Prot		c0.32			0.07							
v/s Ratio Perm										0.18	0.18	0.08
w/c Ratio		0.78			0.18					0.48	0.48	0.20
Uniform Delay, d1		9.5			7.0					9.0	9.0	8.0
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		2.7			0.1					0.6	0.3	0.2
Delay (s)		12.2			7.0					9.6	9.3	8.1
Level of Service		B			A					A	A	A
Approach Delay (s)		12.2			7.0			0.0			9.0	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			10.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			37.5			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			77.2%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Tulare St & 41 Off- Ramp

4/25/2011

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Volume (vph)	133	186	0	413	212	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1583		3539	1770	1583
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3539	1583		3539	1770	1583
Peak-hour factor, PHF	0.83	0.83	0.75	0.75	0.82	0.82
Adj. Flow (vph)	160	224	0	551	259	206
RTOR Reduction (vph)	0	147	0	0	0	99
Lane Group Flow (vph)	160	77	0	551	259	107
Turn Type		Perm				Perm
Protected Phases	6			6	8	
Permitted Phases		6				8
Actuated Green, G (s)	20.3	20.3		20.3	30.8	30.8
Effective Green, g (s)	20.3	20.3		20.3	30.8	30.8
Actuated g/C Ratio	0.34	0.34		0.34	0.52	0.52
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1
Vehicle Extension (s)	3.0	3.0		3.0	0.2	0.2
Lane Grp Cap (vph)	1211	542		1211	919	822
v/s Ratio Prot	0.05			0.16	0.15	
v/s Ratio Perm		0.05				0.07
v/c Ratio	0.13	0.14		0.45	0.28	0.13
Uniform Delay, d1	13.4	13.5		15.2	8.0	7.3
Progression Factor	1.00	1.00		0.63	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.2	0.1	0.0
Delay (s)	13.5	13.6		9.8	8.1	7.4
Level of Service	B	B		A	A	A
Approach Delay (s)	13.5			9.8	7.8	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			10.2		HCM Level of Service	B
HCM Volume to Capacity ratio			0.35			
Actuated Cycle Length (s)			59.3		Sum of lost time (s)	8.2
Intersection Capacity Utilization			34.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

33: Tulare St & 41 Off- Ramp











4/25/2011

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Volume (vph)	374	730	0	341	125	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1583		3539	1770	1583
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3539	1583		3539	1770	1583
Peak-hour factor, PHF	0.73	0.73	0.92	0.92	0.95	0.95
Adj. Flow (vph)	512	1000	0	371	132	294
RTOR Reduction (vph)	0	622	0	0	0	59
Lane Group Flow (vph)	512	378	0	371	132	235
Turn Type		Perm				Perm
Protected Phases	6			6	8	
Permitted Phases		6				8
Actuated Green, G (s)	21.2	21.2		21.2	26.7	26.7
Effective Green, g (s)	21.2	21.2		21.2	26.7	26.7
Actuated g/C Ratio	0.38	0.38		0.38	0.48	0.48
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1
Vehicle Extension (s)	3.0	3.0		3.0	0.2	0.2
Lane Grp Cap (vph)	1337	598		1337	842	753
v/s Ratio Prot	0.14			0.10	0.07	
v/s Ratio Perm		c0.24				c0.15
v/c Ratio	0.38	0.63		0.28	0.16	0.31
Uniform Delay, d1	12.7	14.3		12.1	8.3	9.0
Progression Factor	1.00	1.00		0.59	1.00	1.00
Incremental Delay, d2	0.2	2.2		0.1	0.0	0.1
Delay (s)	12.9	16.4		7.3	8.4	9.1
Level of Service	B	B		A	A	A
Approach Delay (s)	15.2			7.3	8.9	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			12.8		HCM Level of Service	B
HCM Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			56.1		Sum of lost time (s)	8.2
Intersection Capacity Utilization			48.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

330: E Divisadero St &











4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	394	522	332	531	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.1	4.1	4.1		
Lane Util. Factor	1.00	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1947	3893	3893	1742		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1947	3893	3893	1742		
Peak-hour factor, PHF	0.84	0.84	0.79	0.79	0.92	0.92
Adj. Flow (vph)	469	621	420	672	0	0
RTOR Reduction (vph)	0	0	0	437	0	0
Lane Group Flow (vph)	469	621	420	235	0	0
Turn Type	Prot			Perm		
Protected Phases	3	8	4			
Permitted Phases				4		
Actuated Green, G (s)	6.4	30.8	20.7	20.7		
Effective Green, g (s)	6.4	30.8	20.7	20.7		
Actuated g/C Ratio	0.11	0.52	0.35	0.35		
Clearance Time (s)	3.7	4.1	4.1	4.1		
Vehicle Extension (s)	8.0	0.2	4.1	4.1		
Lane Grp Cap (vph)	210	2022	1359	608		
v/s Ratio Prot	c0.24	0.16	0.11			
v/s Ratio Perm				c0.13		
v/c Ratio	2.23	0.31	0.31	0.39		
Uniform Delay, d1	26.4	8.1	14.1	14.5		
Progression Factor	1.00	1.00	1.19	3.23		
Incremental Delay, d2	570.1	0.0	0.2	0.5		
Delay (s)	596.6	8.2	17.0	47.4		
Level of Service	F	A	B	D		
Approach Delay (s)		261.3	35.7		0.0	
Approach LOS		F	D		A	
Intersection Summary						
HCM Average Control Delay			148.4		HCM Level of Service	F
HCM Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			59.3		Sum of lost time (s)	32.2
Intersection Capacity Utilization			65.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

330: E Divisadero St &
























4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	690	757	263	520	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.1	4.1	4.1		
Lane Util. Factor	1.00	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1947	3893	3893	1742		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1947	3893	3893	1742		
Peak-hour factor, PHF	0.86	0.86	0.89	0.89	0.92	0.92
Adj. Flow (vph)	802	880	296	584	0	0
RTOR Reduction (vph)	0	0	0	411	0	0
Lane Group Flow (vph)	802	880	296	173	0	0
Turn Type	Prot			Perm		
Protected Phases	3	8	4			
Permitted Phases				4		
Actuated Green, G (s)	6.4	26.7	16.6	16.6		
Effective Green, g (s)	6.4	26.7	16.6	16.6		
Actuated g/C Ratio	0.11	0.48	0.30	0.30		
Clearance Time (s)	3.7	4.1	4.1	4.1		
Vehicle Extension (s)	8.0	0.2	4.1	4.1		
Lane Grp Cap (vph)	222	1853	1152	515		
v/s Ratio Prot	c0.41	c0.23	0.08			
v/s Ratio Perm				0.10		
v/c Ratio	3.61	0.47	0.26	0.34		
Uniform Delay, d1	24.9	10.0	15.1	15.4		
Progression Factor	1.00	1.00	1.17	2.81		
Incremental Delay, d2	1186.8	0.1	0.2	0.5		
Delay (s)	1211.6	10.0	17.8	43.9		
Level of Service	F	B	B	D		
Approach Delay (s)		583.0	35.1		0.0	
Approach LOS		F	D		A	
Intersection Summary						
HCM Average Control Delay			394.8		HCM Level of Service	F
HCM Volume to Capacity ratio			1.19			
Actuated Cycle Length (s)			56.1		Sum of lost time (s)	29.0
Intersection Capacity Utilization			77.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

34: Tulare St & First St
























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	596	88	93	712	52	388	274	27	186	283	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3503		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3503		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.69	0.69	0.69
Adj. Flow (vph)	112	641	95	101	774	57	456	322	32	270	410	239
RTOR Reduction (vph)	0	0	60	0	8	0	0	0	26	0	0	214
Lane Group Flow (vph)	112	641	35	101	823	0	456	322	6	270	410	25
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			2
Actuated Green, G (s)	5.2	23.0	23.0	5.1	22.6		11.1	11.8	11.8	6.1	6.5	6.5
Effective Green, g (s)	5.2	23.0	23.0	5.1	22.6		11.1	11.8	11.8	6.1	6.5	6.5
Actuated g/C Ratio	0.08	0.36	0.36	0.08	0.36		0.18	0.19	0.19	0.10	0.10	0.10
Clearance Time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.2		2.0	5.0	5.0	2.0	5.2	5.2
Lane Grp Cap (vph)	282	1288	576	277	1253		603	661	296	331	364	163
v/s Ratio Prot	c0.03	0.18		0.03	c0.24		c0.13	0.09		0.08	c0.12	
v/s Ratio Perm			0.02						0.00			0.02
w/c Ratio	0.40	0.50	0.06	0.36	0.66		0.76	0.49	0.02	0.82	1.13	0.15
Uniform Delay, d1	27.5	15.6	13.1	27.5	17.0		24.8	23.0	21.0	28.0	28.4	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.6	0.1	0.3	1.8		4.8	1.2	0.1	13.6	86.0	1.0
Delay (s)	27.8	16.2	13.2	27.8	18.8		29.6	24.2	21.0	41.6	114.4	26.8
Level of Service	C	B	B	C	B		C	C	C	D	F	C
Approach Delay (s)		17.4			19.8			27.1			70.2	
Approach LOS		B			B			C			E	
Intersection Summary												
HCM Average Control Delay			34.1			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			63.2			Sum of lost time (s)			17.8			
Intersection Capacity Utilization			58.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Tulare St & First Street


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	363	853	174	101	578	84	347	413	48	237	325	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3472		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3472		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.91	0.91	0.91	0.84	0.84	0.84	0.86	0.86	0.86
Adj. Flow (vph)	422	992	202	111	635	92	413	492	57	276	378	94
RTOR Reduction (vph)	0	0	91	0	17	0	0	0	46	0	0	84
Lane Group Flow (vph)	422	992	111	111	710	0	413	492	11	276	378	10
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			2
Actuated Green, G (s)	8.0	25.8	25.8	5.4	22.9		10.9	12.4	12.4	6.0	7.2	7.2
Effective Green, g (s)	8.0	25.8	25.8	5.4	22.9		10.9	12.4	12.4	6.0	7.2	7.2
Actuated g/C Ratio	0.12	0.39	0.39	0.08	0.34		0.16	0.19	0.19	0.09	0.11	0.11
Clearance Time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.2		2.0	5.0	5.0	2.0	5.2	5.2
Lane Grp Cap (vph)	411	1367	611	278	1190		560	657	294	308	381	171
v/s Ratio Prot	c0.12	c0.28		0.03	0.20		c0.12	c0.14		0.08	0.11	
v/s Ratio Perm			0.07						0.01			0.01
v/c Ratio	1.03	0.73	0.18	0.40	0.60		0.74	0.75	0.04	0.90	0.99	0.06
Uniform Delay, d1	29.4	17.5	13.5	29.2	18.1		26.6	25.7	22.3	30.1	29.8	26.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	51.4	2.4	0.3	0.3	1.3		4.4	5.6	0.1	26.0	44.0	0.3
Delay (s)	80.8	19.9	13.8	29.5	19.4		30.9	31.3	22.4	56.1	73.7	27.1
Level of Service	F	B	B	C	B		C	C	C	E	E	C
Approach Delay (s)		35.0			20.7			30.6			61.4	
Approach LOS		D			C			C			E	
Intersection Summary												
HCM Average Control Delay			35.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			66.8			Sum of lost time (s)				12.6		
Intersection Capacity Utilization			62.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: H St & Mariposa St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	328	4	26	87	23	6	28	9	83	11	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		1.00			0.98			0.97			0.95	
Flt Protected		1.00			0.99			0.99			0.97	
Satd. Flow (prot)		3533			1803			1796			1726	
Flt Permitted		1.00			0.91			0.96			0.79	
Satd. Flow (perm)		3533			1655			1731			1411	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.78	0.78	0.78
Adj. Flow (vph)	0	364	4	28	95	25	8	36	12	106	14	63
RTOR Reduction (vph)	0	1	0	0	9	0	0	9	0	0	30	0
Lane Group Flow (vph)	0	367	0	0	139	0	0	47	0	0	153	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.1			30.1			15.5			15.5	
Effective Green, g (s)		30.1			30.1			15.5			15.5	
Actuated g/C Ratio		0.55			0.55			0.28			0.28	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)		1948			912			491			401	
v/s Ratio Prot		c0.10										
v/s Ratio Perm					0.08			0.03			c0.11	
v/c Ratio		0.19			0.15			0.10			0.38	
Uniform Delay, d1		6.1			6.0			14.4			15.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			0.0			0.0			0.2	
Delay (s)		6.2			6.0			14.4			15.9	
Level of Service		A			A			B			B	
Approach Delay (s)		6.2			6.0			14.4			15.9	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			9.1			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			54.6			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			53.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: H St & Mariposa St






















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	29	283	8	21	191	129	50	75	22	28	5	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5			4.5			4.5			4.5	
Lane Util. Factor	1.00	0.95			1.00			1.00			1.00	
Frt	1.00	1.00			0.95			0.98			0.92	
Flt Protected	0.95	1.00			1.00			0.98			0.98	
Satd. Flow (prot)	1770	3525			1762			1794			1682	
Flt Permitted	0.53	1.00			0.97			0.87			0.87	
Satd. Flow (perm)	986	3525			1711			1593			1490	
Peak-hour factor, PHF	0.85	0.85	0.85	0.86	0.86	0.86	0.85	0.85	0.85	0.78	0.78	0.78
Adj. Flow (vph)	34	333	9	24	222	150	59	88	26	36	6	65
RTOR Reduction (vph)	0	3	0	0	35	0	0	9	0	0	43	0
Lane Group Flow (vph)	34	339	0	0	361	0	0	164	0	0	64	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	19.3	19.3			19.3			14.0			14.0	
Effective Green, g (s)	19.3	19.3			19.3			14.0			14.0	
Actuated g/C Ratio	0.46	0.46			0.46			0.33			0.33	
Clearance Time (s)	4.5	4.5			4.5			4.5			4.5	
Vehicle Extension (s)	0.2	0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)	450	1608			781			527			493	
v/s Ratio Prot		0.10										
v/s Ratio Perm	0.03				0.21			0.10			0.04	
v/c Ratio	0.08	0.21			0.46			0.31			0.13	
Uniform Delay, d1	6.5	6.9			7.9			10.6			9.9	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.0			0.2			0.1			0.0	
Delay (s)	6.5	6.9			8.1			10.7			9.9	
Level of Service	A	A			A			B			A	
Approach Delay (s)		6.9			8.1			10.7			9.9	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM Average Control Delay			8.3		HCM Level of Service					A		
HCM Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			42.3		Sum of lost time (s)					9.0		
Intersection Capacity Utilization			61.1%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: C Street & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	55	21	10	40	25	39	11	399	31	93	441	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1694		1770	3501		1770	3482	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.44	1.00		0.43	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1694		817	3501		807	3482	
Peak-hour factor, PHF	0.83	0.83	0.83	0.84	0.84	0.84	0.74	0.74	0.74	0.87	0.87	0.87
Adj. Flow (vph)	66	25	12	48	30	46	15	539	42	107	507	61
RTOR Reduction (vph)	0	0	11	0	42	0	0	8	0	0	14	0
Lane Group Flow (vph)	66	25	2	48	34	0	15	573	0	107	554	0
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	3.1	5.0	5.0	2.0	3.9		20.6	20.6		20.6	20.6	
Effective Green, g (s)	3.1	5.0	5.0	2.0	3.9		20.6	20.6		20.6	20.6	
Actuated g/C Ratio	0.08	0.12	0.12	0.05	0.10		0.52	0.52		0.52	0.52	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	137	233	198	89	165		421	1803		416	1793	
v/s Ratio Prot	c0.04	0.01		0.03	c0.02			c0.16			0.16	
v/s Ratio Perm			0.00				0.02			0.13		
v/c Ratio	0.48	0.11	0.01	0.54	0.21		0.04	0.32		0.26	0.31	
Uniform Delay, d1	17.7	15.5	15.3	18.6	16.6		4.8	5.6		5.4	5.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.1	0.0	3.1	0.2		0.1	0.3		0.9	0.3	
Delay (s)	18.7	15.6	15.3	21.7	16.9		4.9	5.9		6.3	5.9	
Level of Service	B	B	B	C	B		A	A		A	A	
Approach Delay (s)		17.5			18.7			5.9			5.9	
Approach LOS		B			B			A			A	






















Intersection Summary

HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

36: C Street & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	141	99	25	98	90	77	14	439	50	104	418	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1733		1770	3485		1770	3429	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.42	1.00		0.39	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1733		773	3485		731	3429	
Peak-hour factor, PHF	0.72	0.72	0.72	0.87	0.87	0.87	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	196	138	35	113	103	89	17	535	61	111	445	116
RTOR Reduction (vph)	0	0	28	0	57	0	0	15	0	0	41	0
Lane Group Flow (vph)	196	138	7	113	135	0	17	581	0	111	520	0
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	8.3	9.7	9.7	5.4	6.8		19.9	19.9		19.9	19.9	
Effective Green, g (s)	8.3	9.7	9.7	5.4	6.8		19.9	19.9		19.9	19.9	
Actuated g/C Ratio	0.18	0.20	0.20	0.11	0.14		0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	310	381	324	202	249		325	1463		307	1440	
v/s Ratio Prot	c0.11	c0.07		0.06	c0.08			c0.17			0.15	
v/s Ratio Perm			0.00				0.02			0.15		
v/c Ratio	0.63	0.36	0.02	0.56	0.54		0.05	0.40		0.36	0.36	
Uniform Delay, d1	18.1	16.2	15.1	19.9	18.8		8.2	9.6		9.4	9.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.2	0.0	1.9	1.3		0.2	0.5		2.0	0.4	
Delay (s)	21.2	16.4	15.1	21.8	20.1		8.3	10.1		11.4	9.8	
Level of Service	C	B	B	C	C		A	B		B	A	
Approach Delay (s)		18.8			20.7			10.0			10.1	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM Average Control Delay			13.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			47.4			Sum of lost time (s)			16.6			
Intersection Capacity Utilization			52.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: 99 SB Off-Ramp & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	545	118	291	0	0	0	0	424	64	61	293	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00	1.00					0.95		1.00	0.95	
Frt	1.00	1.00	0.85					0.98		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3470		1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583					3470		1770	3539	
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.74	0.74	0.74	0.87	0.87	0.87
Adj. Flow (vph)	717	155	383	0	0	0	0	573	86	70	337	0
RTOR Reduction (vph)	0	0	210	0	0	0	0	17	0	0	0	0
Lane Group Flow (vph)	717	155	173	0	0	0	0	642	0	70	337	0
Turn Type	Split		Perm							Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	30.5	30.5	30.5					17.2		4.6	27.0	
Effective Green, g (s)	30.5	30.5	30.5					17.2		4.6	27.0	
Actuated g/C Ratio	0.45	0.45	0.45					0.26		0.07	0.40	
Clearance Time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Vehicle Extension (s)	6.2	6.2	6.2					0.2		2.0	0.2	
Lane Grp Cap (vph)	801	843	716					886		121	1418	
v/s Ratio Prot	c0.41	0.08						c0.18		c0.04	0.10	
v/s Ratio Perm			0.11									
v/c Ratio	0.90	0.18	0.24					0.72		0.58	0.24	
Uniform Delay, d1	17.0	11.0	11.3					22.9		30.5	13.4	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	13.9	0.3	0.5					2.5		4.1	0.0	
Delay (s)	30.9	11.3	11.9					25.4		34.6	13.4	
Level of Service	C	B	B					C		C	B	
Approach Delay (s)		22.6			0.0			25.4			17.1	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM Average Control Delay			22.5									HCM Level of Service C
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			67.4							15.1		
Intersection Capacity Utilization			89.6%							E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: 99 SB Off-Ramp & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	173	180	200	0	0	0	0	554	101	244	428	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00	1.00					0.95		1.00	0.95	
Frt	1.00	1.00	0.85					0.98		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3457		1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583					3457		1770	3539	
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	194	202	225	0	0	0	0	609	111	260	455	0
RTOR Reduction (vph)	0	0	152	0	0	0	0	20	0	0	0	0
Lane Group Flow (vph)	194	202	73	0	0	0	0	700	0	260	455	0
Turn Type	Split		Perm							Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	18.8	18.8	18.8					17.6		6.3	29.1	
Effective Green, g (s)	18.8	18.8	18.8					17.6		6.3	29.1	
Actuated g/C Ratio	0.33	0.33	0.33					0.30		0.11	0.50	
Clearance Time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Vehicle Extension (s)	6.2	6.2	6.2					0.2		2.0	0.2	
Lane Grp Cap (vph)	576	606	515					1053		193	1782	
v/s Ratio Prot	c0.11	0.11						c0.20		c0.15	0.13	
v/s Ratio Perm			0.05									
v/c Ratio	0.34	0.33	0.14					0.66		1.35	0.26	
Uniform Delay, d1	14.8	14.8	13.8					17.5		25.8	8.2	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.0	0.4					1.2		186.5	0.0	
Delay (s)	15.8	15.7	14.2					18.8		212.3	8.2	
Level of Service	B	B	B					B		F	A	
Approach Delay (s)		15.2			0.0			18.8			82.4	
Approach LOS		B			A			B			F	
Intersection Summary												
HCM Average Control Delay			39.8									
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			57.8							15.1		
Intersection Capacity Utilization			71.6%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 99 NB On-Ramp & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	91	156	440	178	788	0	0	282	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3475	1583	1770	3539			3539	1583
Flt Permitted					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					3475	1583	1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	100	171	484	187	829	0	0	307	166
RTOR Reduction (vph)	0	0	0	0	0	64	0	0	0	0	0	125
Lane Group Flow (vph)	0	0	0	0	271	420	187	829	0	0	307	41
Turn Type				Split		Perm	Prot					Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8						6
Actuated Green, G (s)					25.1	25.1	10.2	30.2			16.3	16.3
Effective Green, g (s)					25.1	25.1	10.2	30.2			16.3	16.3
Actuated g/C Ratio					0.38	0.38	0.15	0.46			0.25	0.25
Clearance Time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Vehicle Extension (s)					5.0	5.0	2.0	0.2			0.2	0.2
Lane Grp Cap (vph)					1324	603	274	1622			875	392
v/s Ratio Prot					0.08		c0.11	c0.23			0.09	
v/s Ratio Perm						c0.27						0.03
v/c Ratio					0.20	0.70	0.68	0.51			0.35	0.10
Uniform Delay, d1					13.7	17.2	26.3	12.6			20.4	19.2
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.2	4.4	5.5	0.1			0.1	0.0
Delay (s)					13.9	21.6	31.8	12.7			20.5	19.2
Level of Service					B	C	C	B			C	B
Approach Delay (s)		0.0			18.8			16.3			20.1	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM Average Control Delay			17.9		HCM Level of Service						B	
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			65.9		Sum of lost time (s)					14.3		
Intersection Capacity Utilization			89.6%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 99 NB On-Ramp & Fresno




















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	95	108	191	306	393	0	0	588	579
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3459	1583	1770	3539			3539	1583
Flt Permitted					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					3459	1583	1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.82	0.82	0.82	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	110	126	222	373	479	0	0	684	673
RTOR Reduction (vph)	0	0	0	0	0	171	0	0	0	0	0	390
Lane Group Flow (vph)	0	0	0	0	236	51	373	479	0	0	684	283
Turn Type				Split		Perm	Prot					Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8						6
Actuated Green, G (s)					13.0	13.0	11.4	32.5			17.4	17.4
Effective Green, g (s)					13.0	13.0	11.4	32.5			17.4	17.4
Actuated g/C Ratio					0.23	0.23	0.20	0.58			0.31	0.31
Clearance Time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Vehicle Extension (s)					5.0	5.0	2.0	0.2			0.2	0.2
Lane Grp Cap (vph)					802	367	360	2050			1098	491
v/s Ratio Prot					c0.07		c0.21	0.14			c0.19	
v/s Ratio Perm						0.03						0.18
v/c Ratio					0.29	0.14	1.04	0.23			0.62	0.58
Uniform Delay, d1					17.8	17.1	22.4	5.7			16.5	16.2
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.4	0.4	57.1	0.0			0.8	1.0
Delay (s)					18.2	17.5	79.4	5.8			17.3	17.3
Level of Service					B	B	E	A			B	B
Approach Delay (s)		0.0			17.8			38.0			17.3	
Approach LOS		A			B			D			B	
Intersection Summary												
HCM Average Control Delay			24.0		HCM Level of Service						C	
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			56.1		Sum of lost time (s)					14.3		
Intersection Capacity Utilization			71.6%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

39: G St & Fresno




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	33	97	45	47	95	29	0	892	24	0	259	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Lane Util. Factor	1.00	0.95	1.00		0.95			0.95			0.95	1.00
Frt	1.00	1.00	0.85		0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99			1.00			1.00	1.00
Satd. Flow (prot)	1770	3539	1583		3402			3525			3539	1583
Flt Permitted	0.61	1.00	1.00		0.84			1.00			1.00	1.00
Satd. Flow (perm)	1142	3539	1583		2890			3525			3539	1583
Peak-hour factor, PHF	0.75	0.75	0.75	0.77	0.77	0.77	0.78	0.78	0.78	0.90	0.90	0.90
Adj. Flow (vph)	44	129	60	61	123	38	0	1144	31	0	288	24
RTOR Reduction (vph)	0	0	49	0	31	0	0	2	0	0	0	9
Lane Group Flow (vph)	44	129	11	0	191	0	0	1173	0	0	288	15
Turn Type	Perm		Perm	Perm								Perm
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4								2
Actuated Green, G (s)	8.5	8.5	8.5		8.5			31.1			31.1	31.1
Effective Green, g (s)	8.5	8.5	8.5		8.5			31.1			31.1	31.1
Actuated g/C Ratio	0.18	0.18	0.18		0.18			0.64			0.64	0.64
Clearance Time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0			5.0			5.0	5.0
Lane Grp Cap (vph)	201	623	279		509			2270			2279	1019
v/s Ratio Prot		0.04						0.33			0.08	
v/s Ratio Perm	0.04		0.01		0.07							0.01
v/c Ratio	0.22	0.21	0.04		0.37			0.52			0.13	0.02
Uniform Delay, d1	17.1	17.0	16.5		17.6			4.6			3.3	3.1
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.1	0.0		0.2			0.4			0.1	0.0
Delay (s)	17.3	17.1	16.5		17.7			5.0			3.4	3.1
Level of Service	B	B	B		B			A			A	A
Approach Delay (s)		17.0			17.7			5.0			3.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			7.6			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			48.3			Sum of lost time (s)			8.7			
Intersection Capacity Utilization			48.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

39: G St & Fresno




















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	21	71	52	103	148	30	0	395	18	0	718	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Lane Util. Factor	1.00	0.95	1.00		0.95			0.95			0.95	1.00
Frt	1.00	1.00	0.85		0.98			0.99			1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98			1.00			1.00	1.00
Satd. Flow (prot)	1770	3539	1583		3420			3516			3539	1583
Flt Permitted	0.55	1.00	1.00		0.82			1.00			1.00	1.00
Satd. Flow (perm)	1029	3539	1583		2867			3516			3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.90	0.90	0.90	0.79	0.79	0.79
Adj. Flow (vph)	24	81	59	121	174	35	0	439	20	0	909	54
RTOR Reduction (vph)	0	0	47	0	17	0	0	4	0	0	0	21
Lane Group Flow (vph)	24	81	12	0	313	0	0	455	0	0	909	33
Turn Type	Perm		Perm	Perm								Perm
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4								2
Actuated Green, G (s)	10.3	10.3	10.3		10.3			30.6			30.6	30.6
Effective Green, g (s)	10.3	10.3	10.3		10.3			30.6			30.6	30.6
Actuated g/C Ratio	0.21	0.21	0.21		0.21			0.62			0.62	0.62
Clearance Time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0			5.0			5.0	5.0
Lane Grp Cap (vph)	214	735	329		595			2169			2183	977
v/s Ratio Prot		0.02						0.13			0.26	
v/s Ratio Perm	0.02		0.01		0.11							0.02
v/c Ratio	0.11	0.11	0.04		0.53			0.21			0.42	0.03
Uniform Delay, d1	15.9	15.9	15.7		17.5			4.2			4.9	3.7
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0		0.4			0.1			0.3	0.0
Delay (s)	16.0	16.0	15.7		17.9			4.3			5.2	3.7
Level of Service	B	B	B		B			A			A	A
Approach Delay (s)		15.9			17.9			4.3			5.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.0			HCM Level of Service					A	
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			49.6			Sum of lost time (s)					8.7	
Intersection Capacity Utilization			48.2%			ICU Level of Service					A	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno

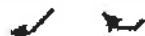
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Movement	SEL	SET	SER	NWL2	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	83	23	19	12	1	3	35	72	390	79	54	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	12	12
Total Lost time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Lane Util. Factor	1.00	1.00			1.00	1.00			0.95		1.00	1.00
Frt	1.00	0.93			1.00	0.86			0.98		1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99		0.95	1.00
Satd. Flow (prot)	1770	1737			1947	1607			3439		1770	1863
Flt Permitted	1.00	1.00			1.00	1.00			0.87		0.52	1.00
Satd. Flow (perm)	1863	1737			2049	1607			3022		968	1863
Peak-hour factor, PHF	0.82	0.82	0.82	0.79	0.79	0.79	0.79	0.96	0.96	0.96	0.77	0.77
Adj. Flow (vph)	101	28	23	15	1	4	44	75	406	82	70	244
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	25	0	0	0
Lane Group Flow (vph)	101	51	0	0	16	10	0	0	538	0	70	244
Turn Type	Perm			Perm				Perm			Perm	
Protected Phases		4				4			2			2
Permitted Phases	4			4	4			2			2	
Actuated Green, G (s)	2.7	2.7			2.7	2.7			7.7		7.7	7.7
Effective Green, g (s)	2.7	2.7			2.7	2.7			7.7		7.7	7.7
Actuated g/C Ratio	0.14	0.14			0.14	0.14			0.39		0.39	0.39
Clearance Time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Vehicle Extension (s)	0.2	0.2			0.2	0.2			0.2		0.2	0.2
Lane Grp Cap (vph)	252	234			277	217			1163		373	717
v/s Ratio Prot		0.03				0.01						0.13
v/s Ratio Perm	c0.05				0.01				c0.18		0.07	
v/c Ratio	0.40	0.22			0.06	0.05			0.46		0.19	0.34
Uniform Delay, d1	7.9	7.7			7.5	7.5			4.6		4.1	4.4
Progression Factor	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Incremental Delay, d2	0.4	0.2			0.0	0.0			0.1		0.1	0.1
Delay (s)	8.3	7.9			7.6	7.6			4.7		4.2	4.5
Level of Service	A	A			A	A			A		A	A
Approach Delay (s)		8.2				7.6			4.7			4.2
Approach LOS		A				A			A			A
Intersection Summary												
HCM Average Control Delay			5.1		HCM Level of Service				A			
HCM Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			20.0		Sum of lost time (s)				9.6			
Intersection Capacity Utilization			48.6%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno

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Movement	SWR	SWR2
Lane Configurations	2	
Volume (vph)	5	117
Ideal Flow (vphpl)	1900	1900
Lane Width	15	12
Total Lost time (s)	4.8	
Lane Util. Factor	1.00	
Frt	0.85	
Flt Protected	1.00	
Satd. Flow (prot)	1742	
Flt Permitted	1.00	
Satd. Flow (perm)	1742	
Peak-hour factor, PHF	0.77	0.77
Adj. Flow (vph)	6	152
RTOR Reduction (vph)	93	0
Lane Group Flow (vph)	65	0
Turn Type	Perm	
Protected Phases		
Permitted Phases	2	
Actuated Green, G (s)	7.7	
Effective Green, g (s)	7.7	
Actuated g/C Ratio	0.39	
Clearance Time (s)	4.8	
Vehicle Extension (s)	0.2	
Lane Grp Cap (vph)	671	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.10	
Uniform Delay, d1	3.9	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	4.0	
Level of Service	A	
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL2	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	139	8	63	86	3	14	115	11	334	20	72	514
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	12	12
Total Lost time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Lane Util. Factor	1.00	1.00			1.00	1.00			0.95		1.00	1.00
Frt	1.00	0.87			1.00	0.87			0.99		1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00			1.00		0.95	1.00
Satd. Flow (prot)	1770	1615			1947	1614			3505		1770	1863
Flt Permitted	0.65	1.00			0.68	1.00			0.93		0.52	1.00
Satd. Flow (perm)	1216	1615			1387	1614			3281		961	1863
Peak-hour factor, PHF	0.57	0.57	0.57	0.78	0.78	0.78	0.78	0.91	0.91	0.91	0.92	0.92
Adj. Flow (vph)	244	14	111	110	4	18	147	12	367	22	78	559
RTOR Reduction (vph)	0	0	0	0	0	103	0	0	7	0	0	0
Lane Group Flow (vph)	244	125	0	0	114	62	0	0	394	0	78	559
Turn Type	Perm			Perm	Perm			Perm			Perm	
Protected Phases		4				4			2			2
Permitted Phases	4			4	4			2			2	
Actuated Green, G (s)	10.0	10.0			10.0	10.0			14.1		14.1	14.1
Effective Green, g (s)	10.0	10.0			10.0	10.0			14.1		14.1	14.1
Actuated g/C Ratio	0.30	0.30			0.30	0.30			0.42		0.42	0.42
Clearance Time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Vehicle Extension (s)	0.2	0.2			0.2	0.2			0.2		0.2	0.2
Lane Grp Cap (vph)	361	479			412	479			1373		402	779
v/s Ratio Prot		0.08				0.04						c0.30
v/s Ratio Perm	c0.20				0.08				0.12		0.08	
v/c Ratio	0.68	0.26			0.28	0.13			0.29		0.19	0.72
Uniform Delay, d1	10.4	9.0			9.1	8.7			6.5		6.2	8.1
Progression Factor	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Incremental Delay, d2	3.9	0.1			0.1	0.0			0.0		0.1	2.6
Delay (s)	14.3	9.1			9.2	8.7			6.5		6.3	10.8
Level of Service	B	A			A	A			A		A	B
Approach Delay (s)		12.6				8.9			6.5			9.7
Approach LOS		B				A			A			A
Intersection Summary												
HCM Average Control Delay			9.5		HCM Level of Service				A			
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			33.7		Sum of lost time (s)				9.6			
Intersection Capacity Utilization			68.8%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno





















4/25/2011

	↙	↘
Movement	SWR	SWR2
Lane Configurations	1	1
Volume (vph)	4	77
Ideal Flow (vphpl)	1900	1900
Lane Width	15	12
Total Lost time (s)	4.8	
Lane Util. Factor	1.00	
Frt	0.85	
Frt Protected	1.00	
Satd. Flow (prot)	1742	
Frt Permitted	1.00	
Satd. Flow (perm)	1742	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	4	84
RTOR Reduction (vph)	49	0
Lane Group Flow (vph)	39	0
Turn Type	Perm	
Protected Phases		
Permitted Phases	2	
Actuated Green, G (s)	14.1	
Effective Green, g (s)	14.1	
Actuated g/C Ratio	0.42	
Clearance Time (s)	4.8	
Vehicle Extension (s)	0.2	
Lane Grp Cap (vph)	729	
v/s Ratio Prot		
v/s Ratio Perm	0.02	
v/c Ratio	0.05	
Uniform Delay, d1	5.8	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	5.8	
Level of Service	A	
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

42: Van Ness Ave & Fresno





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	69	207	114	99	265	204	146	416	92	63	228	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.93		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1763		1770	3308		1770	3443		1770	3432	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1763		1770	3308		1770	3443		1770	3432	
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.96	0.96	0.96	0.80	0.80	0.80
Adj. Flow (vph)	82	246	136	116	312	240	152	433	96	79	285	72
RTOR Reduction (vph)	0	19	0	0	140	0	0	19	0	0	24	0
Lane Group Flow (vph)	82	363	0	116	412	0	152	510	0	79	333	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.1	21.4		8.6	22.9		11.8	22.9		7.2	18.3	
Effective Green, g (s)	7.1	21.4		8.6	22.9		11.8	22.9		7.2	18.3	
Actuated g/C Ratio	0.09	0.28		0.11	0.30		0.15	0.30		0.09	0.24	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	164	492		198	988		272	1028		166	819	
v/s Ratio Prot	0.05	c0.21		c0.07	0.12		c0.09	c0.15		0.04	0.10	
v/s Ratio Perm												
v/c Ratio	0.50	0.74		0.59	0.42		0.56	0.50		0.48	0.41	
Uniform Delay, d1	33.1	25.1		32.4	21.6		30.0	22.1		33.0	24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	6.9		4.4	0.6		2.5	0.8		2.1	0.7	
Delay (s)	35.5	32.0		36.7	22.2		32.5	22.9		35.1	25.3	
Level of Service	D	C		D	C		C	C		D	C	
Approach Delay (s)		32.6			24.7			25.1			27.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			26.9			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			76.7			Sum of lost time (s)			12.4			
Intersection Capacity Utilization			55.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Van Ness Ave & Fresno


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	62	200	134	126	384	140	177	299	64	61	327	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.96		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1751		1770	3397		1770	3445		1770	3471	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1751		1770	3397		1770	3445		1770	3471	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.99	0.99	0.99	0.83	0.83	0.83
Adj. Flow (vph)	71	230	154	137	417	152	179	302	65	73	394	58
RTOR Reduction (vph)	0	23	0	0	36	0	0	18	0	0	13	0
Lane Group Flow (vph)	71	361	0	137	533	0	179	349	0	73	439	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.1	22.1		11.5	26.5		12.7	25.0		7.4	19.7	
Effective Green, g (s)	7.1	22.1		11.5	26.5		12.7	25.0		7.4	19.7	
Actuated g/C Ratio	0.09	0.27		0.14	0.32		0.15	0.30		0.09	0.24	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	152	468		246	1090		272	1043		159	828	
v/s Ratio Prot	0.04	c0.21		c0.08	0.16		c0.10	0.10		0.04	c0.13	
v/s Ratio Perm												
v/c Ratio	0.47	0.77		0.56	0.49		0.66	0.33		0.46	0.53	
Uniform Delay, d1	35.9	27.9		33.2	22.6		32.9	22.3		35.7	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	8.9		2.7	0.7		5.7	0.4		2.1	1.2	
Delay (s)	38.2	36.8		35.9	23.3		38.6	22.7		37.8	28.6	
Level of Service	D	D		D	C		D	C		D	C	
Approach Delay (s)		37.0			25.8			27.9			29.9	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			29.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			82.6			Sum of lost time (s)			16.6			
Intersection Capacity Utilization			59.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: M St & Fresno


















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	39	247	44	0	0	0	0	402	182	113	411	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.95		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5051	1583					3374		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.32	1.00	
Satd. Flow (perm)		5051	1583					3374		593	3539	
Peak-hour factor, PHF	0.80	0.80	0.80	0.92	0.92	0.92	0.77	0.77	0.77	0.94	0.94	0.94
Adj. Flow (vph)	49	309	55	0	0	0	0	522	236	120	437	0
RTOR Reduction (vph)	0	0	36	0	0	0	0	88	0	0	0	0
Lane Group Flow (vph)	0	358	19	0	0	0	0	670	0	120	437	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			2	
Permitted Phases			4							2		
Actuated Green, G (s)		20.0	20.0					31.0		31.0	31.0	
Effective Green, g (s)		20.0	20.0					31.0		31.0	31.0	
Actuated g/C Ratio		0.34	0.34					0.52		0.52	0.52	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1701	533					1761		309	1847	
v/s Ratio Prot		c0.07						0.20			0.12	
v/s Ratio Perm			0.01							c0.20		
v/c Ratio		0.21	0.03					0.38		0.39	0.24	
Uniform Delay, d1		14.1	13.2					8.5		8.5	7.7	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0					0.1		0.3	0.0	
Delay (s)		14.1	13.2					8.5		8.8	7.8	
Level of Service		B	B					A		A	A	
Approach Delay (s)		14.0			0.0			8.5			8.0	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			9.7								A	
HCM Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			59.4							8.4		
Intersection Capacity Utilization			78.8%							D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: M St & Fresno

















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	47	195	38	0	0	0	0	473	125	49	416	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5037	1583					3428		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.33	1.00	
Satd. Flow (perm)		5037	1583					3428		611	3539	
Peak-hour factor, PHF	0.82	0.82	0.82	0.92	0.92	0.92	0.81	0.81	0.81	0.91	0.91	0.91
Adj. Flow (vph)	57	238	46	0	0	0	0	584	154	54	457	0
RTOR Reduction (vph)	0	0	31	0	0	0	0	40	0	0	0	0
Lane Group Flow (vph)	0	295	15	0	0	0	0	698	0	54	457	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			2	
Permitted Phases			4							2		
Actuated Green, G (s)		20.0	20.0					31.0		31.0	31.0	
Effective Green, g (s)		20.0	20.0					31.0		31.0	31.0	
Actuated g/C Ratio		0.34	0.34					0.52		0.52	0.52	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1696	533					1789		319	1847	
v/s Ratio Prot		0.06						0.20			0.13	
v/s Ratio Perm			0.01							0.09		
v/c Ratio		0.17	0.03					0.39		0.17	0.25	
Uniform Delay, d1		13.9	13.2					8.5		7.4	7.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0					0.1		0.1	0.0	
Delay (s)		13.9	13.2					8.6		7.5	7.8	
Level of Service		B	B					A		A	A	
Approach Delay (s)		13.8			0.0			8.6			7.8	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			9.4								A	
HCM Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			59.4							8.4		
Intersection Capacity Utilization			78.8%							D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

44: P St & Fresno

















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	46	136	33	50	302	0	0	569	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	15	15	15	12	12	15	15	12	12
Total Lost time (s)					4.2		4.2	4.2			4.2	
Lane Util. Factor					0.95		1.00	0.95			0.95	
Frt					0.98		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3763		1770	3539			3463	
Flt Permitted					0.99		0.31	1.00			1.00	
Satd. Flow (perm)					3763		571	3539			3463	
Peak-hour factor, PHF	0.92	0.92	0.92	0.75	0.75	0.75	0.97	0.97	0.97	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	61	181	44	52	311	0	0	647	109
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	0	0	26	0
Lane Group Flow (vph)	0	0	0	0	259	0	52	311	0	0	730	0
Turn Type				Split			Perm					
Protected Phases				2	2			4			4	
Permitted Phases							4					
Actuated Green, G (s)					19.8		23.8	23.8			23.8	
Effective Green, g (s)					19.8		23.8	23.8			23.8	
Actuated g/C Ratio					0.38		0.46	0.46			0.46	
Clearance Time (s)					4.2		4.2	4.2			4.2	
Vehicle Extension (s)					0.2		0.2	0.2			0.2	
Lane Grp Cap (vph)					1433		261	1620			1585	
v/s Ratio Prot					c0.07			0.09			c0.21	
v/s Ratio Perm							0.09					
v/c Ratio					0.18		0.20	0.19			0.46	
Uniform Delay, d1					10.7		8.4	8.4			9.7	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					0.0		0.1	0.0			0.1	
Delay (s)					10.7		8.6	8.4			9.8	
Level of Service					B		A	A			A	
Approach Delay (s)		0.0			10.7			8.4			9.8	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			9.6								A	
HCM Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			52.0							8.4		
Intersection Capacity Utilization			78.8%							D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

44: P St & Fresno
























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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	44	305	94	75	561	0	0	364	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	15	15	15	12	12	15	15	12	12
Total Lost time (s)					4.2		4.2	4.2			4.2	
Lane Util. Factor					0.95		1.00	0.95			0.95	
Flt					0.97		1.00	1.00			0.97	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3750		1770	3539			3449	
Flt Permitted					1.00		0.48	1.00			1.00	
Satd. Flow (perm)					3750		899	3539			3449	
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.80	0.80	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	55	381	118	82	610	0	0	383	78
RTOR Reduction (vph)	0	0	0	0	47	0	0	0	0	0	33	0
Lane Group Flow (vph)	0	0	0	0	507	0	82	610	0	0	428	0
Turn Type				Split			Perm					
Protected Phases				2	2			4			4	
Permitted Phases							4					
Actuated Green, G (s)					19.8		23.8	23.8			23.8	
Effective Green, g (s)					19.8		23.8	23.8			23.8	
Actuated g/C Ratio					0.38		0.46	0.46			0.46	
Clearance Time (s)					4.2		4.2	4.2			4.2	
Vehicle Extension (s)					0.2		0.2	0.2			0.2	
Lane Grp Cap (vph)					1428		411	1620			1579	
v/s Ratio Prot					c0.14			c0.17			0.12	
v/s Ratio Perm							0.09					
v/c Ratio					0.35		0.20	0.38			0.27	
Uniform Delay, d1					11.5		8.4	9.2			8.7	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					0.1		0.1	0.1			0.0	
Delay (s)					11.6		8.5	9.3			8.8	
Level of Service					B		A	A			A	
Approach Delay (s)		0.0			11.6			9.2			8.8	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			9.9		HCM Level of Service					A		
HCM Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			52.0		Sum of lost time (s)					8.4		
Intersection Capacity Utilization			78.8%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

45: R Street & Fresno
























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	104	183	25	83	180	53	24	204	32	68	460	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1799		1770	3539	1583	1770	3539	1583
Flt Permitted	0.58	1.00	1.00	0.62	1.00		0.42	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	1084	1863	1583	1150	1799		785	3539	1583	1110	3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.95	0.95	0.95	0.81	0.81	0.81	0.86	0.86	0.86
Adj. Flow (vph)	122	215	29	87	189	56	30	252	40	79	535	172
RTOR Reduction (vph)	0	0	17	0	15	0	0	0	23	0	0	97
Lane Group Flow (vph)	122	215	12	87	230	0	30	252	17	79	535	75
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2	2	2	2			4		4	4		4
Actuated Green, G (s)	25.0	25.0	25.0	25.0	25.0		26.0	26.0	26.0	26.0	26.0	26.0
Effective Green, g (s)	25.0	25.0	25.0	25.0	25.0		26.0	26.0	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42		0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	452	776	660	479	750		340	1534	686	481	1534	686
v/s Ratio Prot		0.12			c0.13			0.07			c0.15	
v/s Ratio Perm	0.11		0.01	0.08			0.04		0.01	0.07		0.05
v/c Ratio	0.27	0.28	0.02	0.18	0.31		0.09	0.16	0.03	0.16	0.35	0.11
Uniform Delay, d1	11.5	11.5	10.3	11.0	11.7		10.0	10.4	9.7	10.4	11.3	10.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0	0.1	0.1		0.0	0.0	0.0	0.1	0.1	0.0
Delay (s)	11.6	11.6	10.3	11.1	11.8		10.1	10.4	9.7	10.4	11.4	10.1
Level of Service	B	B	B	B	B		B	B	A	B	B	B
Approach Delay (s)		11.5			11.6			10.3			11.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			11.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			100.0%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

45: R Street & Fresno
























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	150	229	39	78	215	94	43	563	81	56	305	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1778		1770	3539	1583	1770	3539	1583
Flt Permitted	0.40	1.00	1.00	0.58	1.00		0.55	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	744	1863	1583	1083	1778		1016	3539	1583	670	3539	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.75	0.75	0.75	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	161	246	42	104	287	125	48	633	91	63	343	116
RTOR Reduction (vph)	0	0	24	0	21	0	0	0	52	0	0	66
Lane Group Flow (vph)	161	246	18	104	391	0	48	633	39	63	343	50
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2	2	2	2			4		4	4		4
Actuated Green, G (s)	25.3	25.3	25.3	25.3	25.3		26.0	26.0	26.0	26.0	26.0	26.0
Effective Green, g (s)	25.3	25.3	25.3	25.3	25.3		26.0	26.0	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42		0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	312	782	664	454	746		438	1526	683	289	1526	683
v/s Ratio Prot		0.13			c0.22			c0.18			0.10	
v/s Ratio Perm	0.22		0.01	0.10			0.05		0.02	0.09		0.03
v/c Ratio	0.52	0.31	0.03	0.23	0.52		0.11	0.41	0.06	0.22	0.22	0.07
Uniform Delay, d1	13.0	11.7	10.3	11.2	13.0		10.2	11.9	10.0	10.8	10.8	10.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.0	0.1	0.3		0.0	0.1	0.0	0.1	0.0	0.0
Delay (s)	13.6	11.8	10.3	11.3	13.3		10.3	11.9	10.0	10.9	10.8	10.1
Level of Service	B	B	B	B	B		B	B	B	B	B	B
Approach Delay (s)		12.3			12.9			11.6			10.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			11.8			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			60.3			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			99.5%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: E Divisadero St & Fresno St.
























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (vph)	8	69	6	459	106	367	234	275	17	31	150	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.88	1.00	1.00	0.97	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	1841		1681	1715	1583	1770	2787	1583	1770	3433	1583
Flt Permitted	0.41	1.00		0.68	0.73	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	760	1841		1196	1298	1583	1770	2787	1583	1770	3433	1583
Peak-hour factor, PHF	0.59	0.59	0.59	0.87	0.87	0.87	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	14	117	10	528	122	422	266	312	19	35	169	234
RTOR Reduction (vph)	0	4	0	0	0	285	0	0	11	0	0	184
Lane Group Flow (vph)	14	123	0	317	333	137	266	312	8	35	169	50
Turn Type	Perm			Perm			Perm		custom	custom	Prot	Perm
Protected Phases	8			4			5		2		1	6
Permitted Phases	8			4			4			2		6
Actuated Green, G (s)	18.7	18.7		18.7	18.7	18.7	13.5	24.8	24.8	1.1	12.4	12.4
Effective Green, g (s)	18.7	18.7		18.7	18.7	18.7	13.5	24.8	24.8	1.1	12.4	12.4
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.23	0.43	0.43	0.02	0.21	0.21
Clearance Time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	4.8	4.8	2.0	4.8	4.8
Lane Grp Cap (vph)	246	596		387	420	512	413	1196	679	34	736	340
v/s Ratio Prot		0.07					c0.15	c0.11		0.02	0.05	
v/s Ratio Perm	0.02			c0.27	0.26	0.09			0.01			0.03
v/c Ratio	0.06	0.21		0.82	0.79	0.27	0.64	0.26	0.01	1.03	0.23	0.15
Uniform Delay, d1	13.5	14.2		18.0	17.8	14.5	20.0	10.6	9.5	28.3	18.8	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		13.0	10.1	0.3	3.4	0.2	0.0	163.4	0.3	0.4
Delay (s)	13.6	14.3		31.0	27.9	14.8	23.4	10.8	9.5	191.7	19.1	18.8
Level of Service	B	B		C	C	B	C	B	A	F	B	B
Approach Delay (s)		14.3			23.7		16.4				32.7	
Approach LOS		B			C		B				C	
Intersection Summary												
HCM Average Control Delay			22.9			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			57.8			Sum of lost time (s)			8.6			
Intersection Capacity Utilization			52.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: E Divisadero St & Fresno St.


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (vph)	4	117	10	266	23	196	323	238	8	8	318	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.88	1.00	1.00	0.97	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	1841		1681	1698	1583	1770	2787	1583	1770	3433	1583
Flt Permitted	0.60	1.00		0.66	0.66	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	1111	1841		1170	1165	1583	1770	2787	1583	1770	3433	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	5	139	12	313	27	231	351	259	9	10	383	606
RTOR Reduction (vph)	0	5	0	0	0	180	0	0	4	0	0	272
Lane Group Flow (vph)	5	146	0	166	174	51	351	259	5	10	383	334
Turn Type	Perm			Perm		Perm	custom		custom	Prot		Perm
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	14.2	14.2		14.2	14.2	14.2	16.2	36.0	36.0	0.3	20.1	20.1
Effective Green, g (s)	14.2	14.2		14.2	14.2	14.2	16.2	36.0	36.0	0.3	20.1	20.1
Actuated g/C Ratio	0.22	0.22		0.22	0.22	0.22	0.25	0.57	0.57	0.00	0.32	0.32
Clearance Time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	4.8	4.8	2.0	4.8	4.8
Lane Grp Cap (vph)	248	410		261	260	353	450	1575	895	8	1083	500
v/s Ratio Prot		0.08					c0.20	0.09		0.01	0.11	
v/s Ratio Perm	0.00			0.14	c0.15	0.03			0.00			c0.21
v/c Ratio	0.02	0.36		0.64	0.67	0.15	0.78	0.16	0.01	1.25	0.35	0.67
Uniform Delay, d1	19.3	20.9		22.4	22.6	19.9	22.1	6.6	6.0	31.7	16.8	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.5		5.2	6.7	0.2	8.5	0.1	0.0	416.4	0.4	4.3
Delay (s)	19.4	21.4		27.6	29.3	20.1	30.6	6.7	6.0	448.1	17.2	23.2
Level of Service	B	C		C	C	C	C	A	A	F	B	C
Approach Delay (s)		21.4			25.1		20.3				25.1	
Approach LOS		C			C		C				C	
Intersection Summary												
HCM Average Control Delay			23.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			63.7			Sum of lost time (s)			13.2			
Intersection Capacity Utilization			56.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: Broadway St & Fresno St



















4/25/2011

											
Movement	WBL2	WBL	WBR	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations											
Volume (vph)	7	4	134	0	0	110	279	29	0	84	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	15	15	12	12	15	15	12	12
Total Lost time (s)		4.5	4.5			4.5	4.5			4.5	4.5
Lane Util. Factor		1.00	1.00			1.00	1.00			1.00	1.00
Frt		1.00	0.85			1.00	0.99			1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)		1947	1583			1770	1836			1863	1583
Flt Permitted		0.65	1.00			0.68	1.00			1.00	1.00
Satd. Flow (perm)		1332	1583			1273	1836			1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.65	0.65	0.65	0.74	0.74	0.74
Adj. Flow (vph)	7	4	143	0	0	169	429	45	0	114	20
RTOR Reduction (vph)	0	0	96	0	0	0	5	0	0	0	10
Lane Group Flow (vph)	0	11	47	0	0	169	469	0	0	114	10
Turn Type	custom		custom			Perm				Perm	
Protected Phases			4				2			6	
Permitted Phases	4	4				2					6
Actuated Green, G (s)		19.0	19.0			30.1	30.1			30.1	30.1
Effective Green, g (s)		19.0	19.0			30.1	30.1			30.1	30.1
Actuated g/C Ratio		0.33	0.33			0.52	0.52			0.52	0.52
Clearance Time (s)		4.5	4.5			4.5	4.5			4.5	4.5
Vehicle Extension (s)		0.2	0.2			0.2	0.2			0.2	0.2
Lane Grp Cap (vph)		436	518			660	951			965	820
v/s Ratio Prot			c0.03				c0.26			0.06	
v/s Ratio Perm		0.01				0.13					0.01
v/c Ratio		0.03	0.09			0.26	0.49			0.12	0.01
Uniform Delay, d1		13.3	13.6			7.8	9.1			7.2	6.8
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00
Incremental Delay, d2		0.0	0.0			0.1	0.1			0.0	0.0
Delay (s)		13.3	13.6			7.9	9.2			7.2	6.8
Level of Service		B	B			A	A			A	A
Approach Delay (s)		13.6		0.0			8.9			7.1	
Approach LOS		B		A			A			A	
Intersection Summary											
HCM Average Control Delay			9.4			HCM Level of Service				A	
HCM Volume to Capacity ratio			0.34								
Actuated Cycle Length (s)			58.1			Sum of lost time (s)				9.0	
Intersection Capacity Utilization			50.8%			ICU Level of Service				A	
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

47: Broadway St & Fresno St
















4/25/2011

												
Movement	WBL2	WBL	WBR	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations												
Volume (vph)	9	1	105	0	0	103	90	97	0	277	22	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	15	12	15	15	12	12	15	15	12	12	
Total Lost time (s)		4.5	4.5			4.5	4.5			4.5	4.5	
Lane Util. Factor		1.00	1.00			1.00	1.00			1.00	1.00	
Frt		1.00	0.85			1.00	0.92			1.00	0.85	
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00	
Satd. Flow (prot)		1947	1583			1770	1717			1863	1583	
Flt Permitted		0.67	1.00			0.51	1.00			1.00	1.00	
Satd. Flow (perm)		1373	1583			941	1717			1863	1583	
Peak-hour factor, PHF	0.61	0.61	0.61	0.92	0.92	0.76	0.76	0.76	0.78	0.78	0.78	
Adj. Flow (vph)	15	2	172	0	0	136	118	128	0	355	28	
RTOR Reduction (vph)	0	0	116	0	0	0	55	0	0	0	13	
Lane Group Flow (vph)	0	17	56	0	0	136	191	0	0	355	15	
Turn Type	custom		custom			Perm					Perm	
Protected Phases			4				2			6		
Permitted Phases	4	4				2					6	
Actuated Green, G (s)		19.0	19.0			30.1	30.1			30.1	30.1	
Effective Green, g (s)		19.0	19.0			30.1	30.1			30.1	30.1	
Actuated g/C Ratio		0.33	0.33			0.52	0.52			0.52	0.52	
Clearance Time (s)		4.5	4.5			4.5	4.5			4.5	4.5	
Vehicle Extension (s)		0.2	0.2			0.2	0.2			0.2	0.2	
Lane Grp Cap (vph)		449	518			488	890			965	820	
v/s Ratio Prot			c0.04				0.11			c0.19		
v/s Ratio Perm		0.01				0.14					0.01	
v/c Ratio		0.04	0.11			0.28	0.21			0.37	0.02	
Uniform Delay, d1		13.3	13.6			7.9	7.6			8.3	6.8	
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	
Incremental Delay, d2		0.0	0.0			0.1	0.0			0.1	0.0	
Delay (s)		13.3	13.7			8.0	7.6			8.4	6.8	
Level of Service		B	B			A	A			A	A	
Approach Delay (s)		13.6		0.0			7.8			8.3		
Approach LOS		B		A			A			A		
Intersection Summary												
HCM Average Control Delay			9.1			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			58.1			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			75.4%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: E St & Tuolumne St
















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	31	100	0	0	115	57	180	591	34	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.95			0.99				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3498			3363			4997				
Flt Permitted		0.85			1.00			0.99				
Satd. Flow (perm)		3018			3363			4997				
Peak-hour factor, PHF	0.78	0.78	0.78	0.88	0.88	0.88	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	40	128	0	0	131	65	220	721	41	0	0	0
RTOR Reduction (vph)	0	0	0	0	47	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	168	0	0	149	0	0	974	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		8			4		2	2				
Permitted Phases	8											
Actuated Green, G (s)		13.8			13.8			26.4				
Effective Green, g (s)		13.8			13.8			26.4				
Actuated g/C Ratio		0.27			0.27			0.53				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		830			924			2628				
v/s Ratio Prot					0.04			0.19				
v/s Ratio Perm		0.06										
v/c Ratio		0.20			0.16			0.37				
Uniform Delay, d1		14.0			13.8			7.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.0			0.0			0.0				
Delay (s)		14.0			13.8			7.0				
Level of Service		B			B			A				
Approach Delay (s)		14.0			13.8			7.0			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.9			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			50.2			Sum of lost time (s)				10.0		
Intersection Capacity Utilization			55.2%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: E St & Tuolumne St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	32	156	0	0	114	22	99	304	20	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.98			0.99				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3509			3452			4992				
Flt Permitted		0.89			1.00			0.99				
Satd. Flow (perm)		3138			3452			4992				
Peak-hour factor, PHF	0.85	0.85	0.85	0.77	0.77	0.77	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	38	184	0	0	148	29	111	342	22	0	0	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	222	0	0	158	0	0	465	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		8			4		2	2				
Permitted Phases	8											
Actuated Green, G (s)		19.0			19.0			25.0				
Effective Green, g (s)		19.0			19.0			25.0				
Actuated g/C Ratio		0.35			0.35			0.46				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		1104			1215			2311				
v/s Ratio Prot					0.05			0.09				
v/s Ratio Perm		0.07										
v/c Ratio		0.20			0.13			0.20				
Uniform Delay, d1		12.2			11.9			8.6				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.0			0.0			0.0				
Delay (s)		12.2			11.9			8.6				
Level of Service		B			B			A				
Approach Delay (s)		12.2			11.9			8.6			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.20									
Actuated Cycle Length (s)			54.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			55.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: Broadway St &





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	108	97	0	0	13	8	52	495	51	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Lane Util. Factor	0.95	0.95			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	0.99			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1681	1760			1863	1583		5061	1583			
Flt Permitted	0.95	0.99			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1681	1760			1863	1583		5061	1583			
Peak-hour factor, PHF	0.80	0.80	0.80	0.75	0.75	0.75	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	135	121	0	0	17	11	54	516	53	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	10	0	0	28	0	0	0
Lane Group Flow (vph)	121	135	0	0	17	1	0	570	25	0	0	0
Turn Type	Split					Perm	Split		Perm			
Protected Phases	2	2			1		8	8				
Permitted Phases						1			8			
Actuated Green, G (s)	7.5	7.5			2.2	2.2		20.6	20.6			
Effective Green, g (s)	7.5	7.5			2.2	2.2		20.6	20.6			
Actuated g/C Ratio	0.17	0.17			0.05	0.05		0.48	0.48			
Clearance Time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Vehicle Extension (s)	3.8	3.8			2.0	2.0		2.0	2.0			
Lane Grp Cap (vph)	291	305			95	80		2408	753			
v/s Ratio Prot	0.07	c0.08			c0.01			c0.11				
v/s Ratio Perm						0.00			0.02			
v/c Ratio	0.42	0.44			0.18	0.01		0.24	0.03			
Uniform Delay, d1	15.9	16.0			19.7	19.5		6.7	6.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	1.2	1.3			0.3	0.0		0.0	0.0			
Delay (s)	17.2	17.4			20.0	19.5		6.7	6.1			
Level of Service	B	B			C	B		A	A			
Approach Delay (s)		17.3			19.8			6.7			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.1				HCM Level of Service		B			
HCM Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			43.3				Sum of lost time (s)		13.0			
Intersection Capacity Utilization			58.7%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: Broadway St &



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  				
Volume (vph)	63	29	0	0	62	37	29	238	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Lane Util. Factor	0.95	0.95			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	0.98			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1681	1736			1863	1583		5057	1583			
Flt Permitted	0.95	0.98			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1681	1736			1863	1583		5057	1583			
Peak-hour factor, PHF	0.85	0.85	0.85	0.52	0.52	0.52	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	74	34	0	0	119	71	31	251	31	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	19	0	0	0
Lane Group Flow (vph)	53	55	0	0	119	11	0	282	12	0	0	0
Turn Type	Split					Perm	Split		Perm			
Protected Phases	2	2			1		8	8				
Permitted Phases						1			8			
Actuated Green, G (s)	4.2	4.2			5.9	5.9		13.7	13.7			
Effective Green, g (s)	4.2	4.2			5.9	5.9		13.7	13.7			
Actuated g/C Ratio	0.11	0.11			0.16	0.16		0.37	0.37			
Clearance Time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Vehicle Extension (s)	3.8	3.8			2.0	2.0		2.0	2.0			
Lane Grp Cap (vph)	192	198			299	254		1883	589			
v/s Ratio Prot	0.03	0.03			0.06			0.06				
v/s Ratio Perm						0.01			0.01			
v/c Ratio	0.28	0.28			0.40	0.04		0.15	0.02			
Uniform Delay, d1	14.9	14.9			13.9	13.1		7.7	7.3			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	1.0	1.0			0.3	0.0		0.0	0.0			
Delay (s)	15.9	15.9			14.2	13.1		7.7	7.3			
Level of Service	B	B			B	B		A	A			
Approach Delay (s)		15.9			13.8			7.7			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			11.0				HCM Level of Service		B			
HCM Volume to Capacity ratio			0.23									
Actuated Cycle Length (s)			36.8				Sum of lost time (s)		13.0			
Intersection Capacity Utilization			58.7%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Van Ness Ave & Tuolumne St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  				
Volume (vph)	18	305	0	0	308	44	42	426	102	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2			4.2				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.97				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1770	1863			1831			4931				
Flt Permitted	0.45	1.00			1.00			1.00				
Satd. Flow (perm)	843	1863			1831			4931				
Peak-hour factor, PHF	0.87	0.87	0.87	0.91	0.91	0.91	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	21	351	0	0	338	48	49	501	120	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	48	0	0	0	0
Lane Group Flow (vph)	21	351	0	0	378	0	0	622	0	0	0	0
Turn Type	Perm				Split							
Protected Phases		2			6		8	8				
Permitted Phases	2											
Actuated Green, G (s)	27.0	27.0			27.0			22.0				
Effective Green, g (s)	27.0	27.0			27.0			22.0				
Actuated g/C Ratio	0.47	0.47			0.47			0.38				
Clearance Time (s)	4.2	4.2			4.2			4.2				
Vehicle Extension (s)	0.2	0.2			0.2			0.2				
Lane Grp Cap (vph)	397	876			861			1890				
v/s Ratio Prot		0.19			c0.21			c0.13				
v/s Ratio Perm	0.02											
v/c Ratio	0.05	0.40			0.44			0.33				
Uniform Delay, d1	8.3	9.9			10.1			12.5				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	0.0	0.1			0.1			0.0				
Delay (s)	8.3	10.0			10.3			12.5				
Level of Service	A	B			B			B				
Approach Delay (s)		9.9			10.3			12.5			0.0	
Approach LOS		A			B			B			A	
Intersection Summary												
HCM Average Control Delay			11.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			57.4			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			75.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Van Ness Ave & Tuolumne St









4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	9	149	0	0	573	42	44	263	79	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2			4.2				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.99			0.97				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1770	1863			1846			4901				
Flt Permitted	0.18	1.00			1.00			0.99				
Satd. Flow (perm)	331	1863			1846			4901				
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.76	0.76	0.76	0.92	0.92	0.92
Adj. Flow (vph)	10	171	0	0	666	49	58	346	104	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	65	0	0	0	0
Lane Group Flow (vph)	10	171	0	0	711	0	0	443	0	0	0	0
Turn Type	Perm						Split					
Protected Phases	2						6	8				
Permitted Phases	2											
Actuated Green, G (s)	29.0		29.0				22.1					
Effective Green, g (s)	29.0		29.0				22.1					
Actuated g/C Ratio	0.49		0.49				0.37					
Clearance Time (s)	4.2		4.2				4.2					
Vehicle Extension (s)	0.2		0.2				0.2					
Lane Grp Cap (vph)	161		908				900		1820			
v/s Ratio Prot	0.09		c0.39				c0.09					
v/s Ratio Perm	0.03											
v/c Ratio	0.06		0.19				0.79		0.24			
Uniform Delay, d1	8.1		8.6				12.7		12.9			
Progression Factor	1.00		1.00				1.00		1.00			
Incremental Delay, d2	0.1		0.0				4.3		0.0			
Delay (s)	8.1		8.6				17.0		12.9			
Level of Service	A		A				B		B			
Approach Delay (s)			8.6				17.0		12.9		0.0	
Approach LOS			A				B		B		A	
Intersection Summary												
HCM Average Control Delay			14.5		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			59.5		Sum of lost time (s)				8.4			
Intersection Capacity Utilization			84.0%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

51: O St & Tuolumne St









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Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	0	42	246	92	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2			
Lane Util. Factor		1.00	0.91			
Frt		0.86	0.96			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1611	4878			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1611	4878			
Peak-hour factor, PHF	0.81	0.81	0.86	0.86	0.92	0.92
Adj. Flow (vph)	0	52	286	107	0	0
RTOR Reduction (vph)	0	43	57	0	0	0
Lane Group Flow (vph)	0	9	336	0	0	0
Turn Type	custom					
Protected Phases	8					
Permitted Phases	2					
Actuated Green, G (s)	4.0 11.0					
Effective Green, g (s)	4.0 11.0					
Actuated g/C Ratio	0.17 0.47					
Clearance Time (s)	4.2 4.2					
Vehicle Extension (s)	0.2 6.0					
Lane Grp Cap (vph)	275 2293					
v/s Ratio Prot	c0.07					
v/s Ratio Perm	c0.01					
v/c Ratio	0.03 0.15					
Uniform Delay, d1	8.1 3.5					
Progression Factor	1.00 1.00					
Incremental Delay, d2	0.0 0.1					
Delay (s)	8.1 3.6					
Level of Service	A A					
Approach Delay (s)	8.1					0.0
Approach LOS	A					A
Intersection Summary						
HCM Average Control Delay			4.1	HCM Level of Service		A
HCM Volume to Capacity ratio			0.12			
Actuated Cycle Length (s)			23.4	Sum of lost time (s)		8.4
Intersection Capacity Utilization			17.1%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

51: O St & Tuolumne St

















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Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	0	112	387	49	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2			
Lane Util. Factor		1.00	0.91			
Frt		0.86	0.98			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1611	5000			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1611	5000			
Peak-hour factor, PHF	0.85	0.85	0.69	0.69	0.92	0.92
Adj. Flow (vph)	0	132	561	71	0	0
RTOR Reduction (vph)	0	117	23	0	0	0
Lane Group Flow (vph)	0	15	609	0	0	0
Turn Type	custom					
Protected Phases	8					
Permitted Phases	2					
Actuated Green, G (s)	3.1 15.0					
Effective Green, g (s)	3.1 15.0					
Actuated g/C Ratio	0.12 0.57					
Clearance Time (s)	4.2 4.2					
Vehicle Extension (s)	0.2 6.0					
Lane Grp Cap (vph)	188 2830					
v/s Ratio Prot	c0.12					
v/s Ratio Perm	c0.01					
v/c Ratio	0.08 0.22					
Uniform Delay, d1	10.4 2.8					
Progression Factor	1.00 1.00					
Incremental Delay, d2	0.1 0.1					
Delay (s)	10.5 2.9					
Level of Service	B A					
Approach Delay (s)	10.5		2.9			0.0
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			4.3	HCM Level of Service		A
HCM Volume to Capacity ratio			0.19			
Actuated Cycle Length (s)			26.5	Sum of lost time (s)		8.4
Intersection Capacity Utilization			22.5%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

52: E St & Stanislaus St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	117	124	18	262	0	0	0	0	25	227	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4			5.4						5.4	5.4
Lane Util. Factor		0.95			0.95						0.91	1.00
Frt		0.92			1.00						1.00	0.85
Flt Protected		1.00			1.00						1.00	1.00
Satd. Flow (prot)		3265			3528						5060	1583
Flt Permitted		1.00			0.91						1.00	1.00
Satd. Flow (perm)		3265			3232						5060	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	0	139	148	21	305	0	0	0	0	27	244	85
RTOR Reduction (vph)	0	117	0	0	0	0	0	0	0	0	0	70
Lane Group Flow (vph)	0	170	0	0	326	0	0	0	0	0	271	15
Turn Type				Perm						Split		Perm
Protected Phases		2			2					8	8	
Permitted Phases				2								8
Actuated Green, G (s)		3.7			3.7						3.1	3.1
Effective Green, g (s)		3.7			3.7						3.1	3.1
Actuated g/C Ratio		0.21			0.21						0.18	0.18
Clearance Time (s)		5.4			5.4						5.4	5.4
Vehicle Extension (s)		0.2			0.2						0.2	0.2
Lane Grp Cap (vph)		686			679						891	279
v/s Ratio Prot		0.05									0.05	
v/s Ratio Perm					0.10							0.01
v/c Ratio		0.25			0.48						0.30	0.05
Uniform Delay, d1		5.8			6.1						6.3	6.0
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		0.1			0.2						0.1	0.0
Delay (s)		5.9			6.3						6.4	6.1
Level of Service		A			A						A	A
Approach Delay (s)		5.9			6.3			0.0			6.3	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.2			HCM Level of Service					A	
HCM Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			17.6			Sum of lost time (s)				10.8		
Intersection Capacity Utilization			33.4%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

52: E St & Stanislaus St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	141	337	42	159	0	0	0	0	39	724	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4			5.4						5.4	5.4
Lane Util. Factor		0.95			0.95						0.91	1.00
Frt		0.89			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		3165			3503						5072	1583
Flt Permitted		1.00			0.75						1.00	1.00
Satd. Flow (perm)		3165			2640						5072	1583
Peak-hour factor, PHF	0.78	0.78	0.78	0.85	0.85	0.85	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	181	432	49	187	0	0	0	0	53	978	114
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	76
Lane Group Flow (vph)	0	543	0	0	236	0	0	0	0	0	1031	38
Turn Type				Perm						Split		Perm
Protected Phases		2			2					8	8	
Permitted Phases				2								8
Actuated Green, G (s)		7.9			7.9						9.4	9.4
Effective Green, g (s)		7.9			7.9						9.4	9.4
Actuated g/C Ratio		0.28			0.28						0.33	0.33
Clearance Time (s)		5.4			5.4						5.4	5.4
Vehicle Extension (s)		0.2			0.2						0.2	0.2
Lane Grp Cap (vph)		890			742						1697	530
v/s Ratio Prot		c0.17									c0.20	
v/s Ratio Perm					0.09							0.02
v/c Ratio		0.61			0.32						0.61	0.07
Uniform Delay, d1		8.8			8.0						7.8	6.4
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		0.9			0.1						0.4	0.0
Delay (s)		9.6			8.1						8.2	6.4
Level of Service		A			A						A	A
Approach Delay (s)		9.6			8.1			0.0			8.1	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			8.5			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			28.1			Sum of lost time (s)				10.8		
Intersection Capacity Utilization			48.7%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

53: Broadway St & Stanislaus St



















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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	112	44	5	37	0	0	0	0	115	237	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Lane Util. Factor		0.95		1.00	1.00					1.00	0.95	1.00
Frt		0.96		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3389		1770	1863					1770	3539	1583
Flt Permitted		1.00		0.64	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3389		1184	1863					1770	3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.58	0.58	0.58	0.92	0.92	0.92	0.96	0.96	0.96
Adj. Flow (vph)	0	132	52	9	64	0	0	0	0	120	247	3
RTOR Reduction (vph)	0	38	0	0	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	0	146	0	9	64	0	0	0	0	120	247	2
Turn Type				Perm						Split		Perm
Protected Phases		2			2					4	4	
Permitted Phases				2								4
Actuated Green, G (s)		14.4		14.4	14.4					31.4	31.4	31.4
Effective Green, g (s)		14.4		14.4	14.4					31.4	31.4	31.4
Actuated g/C Ratio		0.27		0.27	0.27					0.58	0.58	0.58
Clearance Time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Vehicle Extension (s)		0.2		0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		900		315	495					1025	2050	917
v/s Ratio Prot		c0.04			0.03					0.07	c0.07	
v/s Ratio Perm				0.01								0.00
v/c Ratio		0.16		0.03	0.13					0.12	0.12	0.00
Uniform Delay, d1		15.3		14.7	15.1					5.1	5.2	4.8
Progression Factor		1.00		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.0		0.0	0.0					0.0	0.0	0.0
Delay (s)		15.3		14.7	15.2					5.2	5.2	4.8
Level of Service		B		B	B					A	A	A
Approach Delay (s)		15.3			15.1			0.0			5.2	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			9.3			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.13									
Actuated Cycle Length (s)			54.2			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			58.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

53: Broadway St & Stanislaus St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	44	76	75	46	0	0	0	0	30	533	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Lane Util. Factor		0.95		1.00	1.00					1.00	0.95	1.00
Frt		0.90		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3201		1770	1863					1770	3539	1583
Flt Permitted		1.00		0.67	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3201		1245	1863					1770	3539	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.69	0.69	0.69	0.92	0.92	0.92	0.78	0.78	0.78
Adj. Flow (vph)	0	48	84	109	67	0	0	0	0	38	683	46
RTOR Reduction (vph)	0	63	0	0	0	0	0	0	0	0	0	19
Lane Group Flow (vph)	0	69	0	109	67	0	0	0	0	38	683	27
Turn Type				Perm						Split		Perm
Protected Phases		2			2					4	4	
Permitted Phases				2								4
Actuated Green, G (s)		14.0		14.0	14.0					32.3	32.3	32.3
Effective Green, g (s)		14.0		14.0	14.0					32.3	32.3	32.3
Actuated g/C Ratio		0.26		0.26	0.26					0.59	0.59	0.59
Clearance Time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Vehicle Extension (s)		0.2		0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		819		319	477					1045	2090	935
v/s Ratio Prot		0.02			0.04					0.02	c0.19	
v/s Ratio Perm				c0.09								0.02
v/c Ratio		0.08		0.34	0.14					0.04	0.33	0.03
Uniform Delay, d1		15.5		16.6	15.7					4.7	5.7	4.7
Progression Factor		1.00		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.0		0.2	0.0					0.0	0.0	0.0
Delay (s)		15.5		16.8	15.8					4.7	5.7	4.7
Level of Service		B		B	B					A	A	A
Approach Delay (s)		15.5			16.4			0.0			5.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.6			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			54.7			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			58.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

54: Van Ness Ave & Stanislaus St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	166	5	76	272	0	0	0	0	157	194	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2						4.2	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frt		1.00		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.98	
Satd. Flow (prot)		1855		1770	1863						4961	
Flt Permitted		1.00		0.63	1.00						0.98	
Satd. Flow (perm)		1855		1179	1863						4961	
Peak-hour factor, PHF	0.86	0.86	0.86	0.93	0.93	0.93	0.92	0.92	0.92	0.81	0.81	0.81
Adj. Flow (vph)	0	193	6	82	292	0	0	0	0	194	240	9
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	197	0	82	292	0	0	0	0	0	439	0
Turn Type				Perm						Split		
Protected Phases		2			6					4	4	
Permitted Phases				6								
Actuated Green, G (s)		29.6		29.6	29.6						22.0	
Effective Green, g (s)		29.6		29.6	29.6						22.0	
Actuated g/C Ratio		0.49		0.49	0.49						0.37	
Clearance Time (s)		4.2		4.2	4.2						4.2	
Vehicle Extension (s)		0.2		0.2	0.2						0.2	
Lane Grp Cap (vph)		915		582	919						1819	
v/s Ratio Prot		0.11			c0.16						c0.09	
v/s Ratio Perm				0.07								
v/c Ratio		0.22		0.14	0.32						0.24	
Uniform Delay, d1		8.6		8.3	9.1						13.2	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.5		0.0	0.1						0.0	
Delay (s)		9.2		8.3	9.2						13.2	
Level of Service		A		A	A						B	
Approach Delay (s)		9.2			9.0			0.0			13.2	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM Average Control Delay			10.9			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			75.5%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

54: Van Ness Ave & Stanislaus St















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											  	
Volume (vph)	0	75	5	121	498	0	0	0	0	83	409	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2						4.2	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frt		0.99		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1848		1770	1863						4991	
Flt Permitted		1.00		0.70	1.00						0.99	
Satd. Flow (perm)		1848		1305	1863						4991	
Peak-hour factor, PHF	0.92	0.92	0.92	0.81	0.81	0.81	0.92	0.92	0.92	0.80	0.80	0.80
Adj. Flow (vph)	0	82	5	149	615	0	0	0	0	104	511	48
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	84	0	149	615	0	0	0	0	0	648	0
Turn Type				Perm						Split		
Protected Phases		2			6					4	4	
Permitted Phases				6								
Actuated Green, G (s)		29.6		29.6	29.6						22.0	
Effective Green, g (s)		29.6		29.6	29.6						22.0	
Actuated g/C Ratio		0.49		0.49	0.49						0.37	
Clearance Time (s)		4.2		4.2	4.2						4.2	
Vehicle Extension (s)		0.2		0.2	0.2						0.2	
Lane Grp Cap (vph)		912		644	919						1830	
v/s Ratio Prot		0.05			c0.33						c0.13	
v/s Ratio Perm				0.11								
v/c Ratio		0.09		0.23	0.67						0.35	
Uniform Delay, d1		8.1		8.7	11.5						13.8	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.2		0.1	1.4						0.0	
Delay (s)		8.3		8.8	12.9						13.9	
Level of Service		A		A	B						B	
Approach Delay (s)		8.3			12.1			0.0			13.9	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM Average Control Delay			12.7			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			84.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

55: N Blackstone Ave & Parking Lot















4/25/2011

								
Movement	SBL	SBR	SBR2	SER	NWL	NWT	SWL	SWT
Lane Configurations								
Volume (vph)	167	659	2	9	23	47	97	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12
Total Lost time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Lane Util. Factor	1.00	0.88		1.00		1.00	1.00	0.95
Frt	1.00	0.85		0.86		1.00	1.00	1.00
Flt Protected	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (prot)	1770	2787		1611		1832	1770	3539
Flt Permitted	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (perm)	1770	2787		1611		1832	1770	3539
Peak-hour factor, PHF	0.73	0.73	0.73	0.45	0.63	0.63	0.65	0.65
Adj. Flow (vph)	229	903	3	20	37	75	149	157
RTOR Reduction (vph)	0	0	0	20	0	0	0	0
Lane Group Flow (vph)	229	906	0	0	0	112	149	157
Turn Type		Prot		custom	Split		Split	
Protected Phases	2	2		8	1	1	4	4
Permitted Phases								
Actuated Green, G (s)	20.6	20.6		1.0		6.1	10.7	10.7
Effective Green, g (s)	20.6	20.6		1.0		6.1	10.7	10.7
Actuated g/C Ratio	0.37	0.37		0.02		0.11	0.19	0.19
Clearance Time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Vehicle Extension (s)	4.0	4.0		2.0		2.0	4.0	4.0
Lane Grp Cap (vph)	650	1023		29		199	338	675
v/s Ratio Prot	0.13	c0.33		c0.00		c0.06	c0.08	0.04
v/s Ratio Perm								
v/c Ratio	0.35	0.89		0.01		0.56	0.44	0.23
Uniform Delay, d1	12.9	16.6		27.1		23.7	20.1	19.2
Progression Factor	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	9.6		0.1		2.2	1.3	0.2
Delay (s)	13.4	26.2		27.1		25.9	21.3	19.5
Level of Service	B	C		C		C	C	B
Approach Delay (s)	23.6					25.9		20.4
Approach LOS	C					C		C
Intersection Summary								
HCM Average Control Delay		23.2		HCM Level of Service				C
HCM Volume to Capacity ratio		0.69						
Actuated Cycle Length (s)		56.1		Sum of lost time (s)				17.7
Intersection Capacity Utilization		53.7%		ICU Level of Service				A
Analysis Period (min)		15						
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

55: N Blackstone Ave & Parking Lot

















4/25/2011

								
Movement	SBL	SBR	SBR2	SER	NWL	NWT	SWL	SWT
Lane Configurations								
Volume (vph)	89	291	1	9	15	26	70	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12
Total Lost time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Lane Util. Factor	1.00	0.88		1.00		1.00	1.00	0.95
Frt	1.00	0.85		0.86		1.00	1.00	1.00
Flt Protected	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (prot)	1770	2787		1611		1830	1770	3539
Flt Permitted	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (perm)	1770	2787		1611		1830	1770	3539
Peak-hour factor, PHF	0.86	0.86	0.86	0.63	0.51	0.51	0.64	0.64
Adj. Flow (vph)	103	338	1	14	29	51	109	184
RTOR Reduction (vph)	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	103	339	0	0	0	80	109	184
Turn Type		Prot		custom	Split		Split	
Protected Phases	2	2		8	1	1	4	4
Permitted Phases								
Actuated Green, G (s)	12.8	12.8		0.8		6.5	7.4	7.4
Effective Green, g (s)	12.8	12.8		0.8		6.5	7.4	7.4
Actuated g/C Ratio	0.28	0.28		0.02		0.14	0.16	0.16
Clearance Time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Vehicle Extension (s)	4.0	4.0		2.0		2.0	4.0	4.0
Lane Grp Cap (vph)	501	789		29		263	290	579
v/s Ratio Prot	0.06	c0.12		c0.00		c0.04	c0.06	0.05
v/s Ratio Perm								
v/c Ratio	0.21	0.43		0.01		0.30	0.38	0.32
Uniform Delay, d1	12.3	13.2		21.8		17.3	16.8	16.7
Progression Factor	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5		0.0		0.2	1.1	0.4
Delay (s)	12.6	13.7		21.9		17.6	18.0	17.1
Level of Service	B	B		C		B	B	B
Approach Delay (s)	13.5					17.6		17.4
Approach LOS	B					B		B
Intersection Summary								
HCM Average Control Delay			15.4		HCM Level of Service			B
HCM Volume to Capacity ratio			0.37					
Actuated Cycle Length (s)			45.2		Sum of lost time (s)		17.7	
Intersection Capacity Utilization			40.8%		ICU Level of Service		A	
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

56: E Divisadero St & N Abby St


















4/25/2011

										
Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NWL2	NWL	NWR	NWR2
Lane Configurations										
Volume (vph)	108	299	17	72	94	50	110	36	246	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2	5.2	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.76	
Frt	1.00	0.99		1.00	0.95			1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3355			1770	3610	
Flt Permitted	0.63	1.00		0.53	1.00			0.95	1.00	
Satd. Flow (perm)	1178	3511		988	3355			1770	3610	
Peak-hour factor, PHF	0.85	0.85	0.85	0.76	0.76	0.76	0.86	0.86	0.86	0.86
Adj. Flow (vph)	127	352	20	95	124	66	128	42	286	13
RTOR Reduction (vph)	0	7	0	0	39	0	0	0	7	0
Lane Group Flow (vph)	127	365	0	95	151	0	0	170	292	0
Turn Type	Perm			Perm			Split		Perm	
Protected Phases		4			4		2	2		
Permitted Phases	4			4					2	
Actuated Green, G (s)	23.0	23.0		23.0	23.0			23.0	23.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			23.0	23.0	
Actuated g/C Ratio	0.41	0.41		0.41	0.41			0.41	0.41	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2	5.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			0.2	0.2	
Lane Grp Cap (vph)	480	1432		403	1368			722	1472	
v/s Ratio Prot		0.10			0.04			c0.10		
v/s Ratio Perm	c0.11			0.10					0.08	
v/c Ratio	0.26	0.25		0.24	0.11			0.24	0.20	
Uniform Delay, d1	11.1	11.0		10.9	10.4			10.9	10.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	
Incremental Delay, d2	0.1	0.0		0.1	0.0			0.1	0.0	
Delay (s)	11.2	11.1		11.1	10.4			11.0	10.8	
Level of Service	B	B		B	B			B	B	
Approach Delay (s)		11.1			10.6			10.9		
Approach LOS		B			B			B		
Intersection Summary										
HCM Average Control Delay			10.9			HCM Level of Service			B	
HCM Volume to Capacity ratio			0.25							
Actuated Cycle Length (s)			56.4			Sum of lost time (s)			10.4	
Intersection Capacity Utilization			70.5%			ICU Level of Service			C	
Analysis Period (min)			15							
c Critical Lane Group										

HCM Signalized Intersection Capacity Analysis

56: E Divisadero St & N Abby St


















4/25/2011

										
Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NWL2	NWL	NWR	NWR2
Lane Configurations										
Volume (vph)	220	249	7	68	159	110	104	117	729	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2	5.2	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.76	
Frt	1.00	1.00		1.00	0.94			1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)	1770	3524		1770	3322			1770	3610	
Flt Permitted	0.54	1.00		0.58	1.00			0.95	1.00	
Satd. Flow (perm)	1001	3524		1081	3322			1770	3610	
Peak-hour factor, PHF	0.92	0.92	0.92	0.75	0.75	0.75	0.67	0.67	0.67	0.67
Adj. Flow (vph)	239	271	8	91	212	147	155	175	1088	19
RTOR Reduction (vph)	0	4	0	0	18	0	0	54	2	0
Lane Group Flow (vph)	239	275	0	91	341	0	0	276	1105	0
Turn Type	Perm			Perm			Split		Perm	
Protected Phases		4			4		2	2		
Permitted Phases	4			4					2	
Actuated Green, G (s)	23.4	23.4		23.4	23.4			23.4	23.4	
Effective Green, g (s)	23.4	23.4		23.4	23.4			23.4	23.4	
Actuated g/C Ratio	0.41	0.41		0.41	0.41			0.41	0.41	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2	5.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2			0.2	0.2	
Lane Grp Cap (vph)	410	1442		442	1359			724	1477	
v/s Ratio Prot		0.08			0.10			0.16		
v/s Ratio Perm	c0.24			0.08					c0.31	
v/c Ratio	0.58	0.19		0.21	0.25			0.38	0.75	
Uniform Delay, d1	13.1	10.8		10.9	11.1			11.8	14.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	
Incremental Delay, d2	1.4	0.0		0.1	0.0			0.1	1.8	
Delay (s)	14.5	10.9		11.0	11.2			12.0	16.2	
Level of Service	B	B		B	B			B	B	
Approach Delay (s)		12.5			11.1			15.3		
Approach LOS		B			B			B		
Intersection Summary										
HCM Average Control Delay			13.9			HCM Level of Service			B	
HCM Volume to Capacity ratio			0.67							
Actuated Cycle Length (s)			57.2			Sum of lost time (s)			10.4	
Intersection Capacity Utilization			70.5%			ICU Level of Service			C	
Analysis Period (min)			15							
c Critical Lane Group										

HCM Signalized Intersection Capacity Analysis

57: E Divisadero St & N Blackstone Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	361	31	0	130	0	0	0	0	65	795	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5					4.9	4.9	4.9
Lane Util. Factor		0.95			0.95					1.00	0.95	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3497			3539					1770	3539	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3497			3539					1770	3539	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92	0.77	0.77	0.77
Adj. Flow (vph)	0	430	37	0	151	0	0	0	0	84	1032	144
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	0	67
Lane Group Flow (vph)	0	455	0	0	151	0	0	0	0	84	1032	77
Turn Type										Split		Perm
Protected Phases		4			4					2	2	
Permitted Phases												2
Actuated Green, G (s)		25.5			25.5					20.1	20.1	20.1
Effective Green, g (s)		25.5			25.5					20.1	20.1	20.1
Actuated g/C Ratio		0.46			0.46					0.37	0.37	0.37
Clearance Time (s)		4.5			4.5					4.9	4.9	4.9
Vehicle Extension (s)		5.0			5.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1621			1641					647	1293	579
v/s Ratio Prot		c0.13			0.04					0.05	c0.29	
v/s Ratio Perm												0.05
v/c Ratio		0.28			0.09					0.13	0.80	0.13
Uniform Delay, d1		9.1			8.3					11.6	15.6	11.6
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2			0.1					0.2	4.1	0.2
Delay (s)		9.3			8.3					11.8	19.7	11.9
Level of Service		A			A					B	B	B
Approach Delay (s)		9.3			8.3			0.0			18.3	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM Average Control Delay			15.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			55.0			Sum of lost time (s)				9.4		
Intersection Capacity Utilization			52.3%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis










57: E Divisadero St & N Blackstone Ave

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	379	16	0	276	0	0	0	0	92	357	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5					4.9	4.9	4.9
Lane Util. Factor		0.95			0.95					1.00	0.95	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3518			3539					1770	3539	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3518			3539					1770	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	436	18	0	325	0	0	0	0	107	415	91
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	58
Lane Group Flow (vph)	0	449	0	0	325	0	0	0	0	107	415	33
Turn Type										Split		Perm
Protected Phases		4			4					2	2	
Permitted Phases												2
Actuated Green, G (s)		25.5			25.5					20.1	20.1	20.1
Effective Green, g (s)		25.5			25.5					20.1	20.1	20.1
Actuated g/C Ratio		0.46			0.46					0.37	0.37	0.37
Clearance Time (s)		4.5			4.5					4.9	4.9	4.9
Vehicle Extension (s)		5.0			5.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1631			1641					647	1293	579
v/s Ratio Prot		c0.13			0.09					0.06	c0.12	
v/s Ratio Perm												0.02
v/c Ratio		0.28			0.20					0.17	0.32	0.06
Uniform Delay, d1		9.1			8.7					11.8	12.5	11.3
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2			0.1					0.3	0.3	0.1
Delay (s)		9.3			8.8					12.0	12.8	11.4
Level of Service		A			A					B	B	B
Approach Delay (s)		9.3			8.8			0.0			12.5	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM Average Control Delay			10.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			55.0			Sum of lost time (s)				9.4		
Intersection Capacity Utilization			49.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 58: H St & San Joaquin St










4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	5	454	68	3	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.64	0.64	0.75	0.75	0.50	0.50
Hourly flow rate (vph)	8	709	91	4	10	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	95				818	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	95				818	93
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	99
cM capacity (veh/h)	1499				344	965
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	717	95	16			
Volume Left	8	0	10			
Volume Right	0	4	6			
cSH	1499	1700	453			
Volume to Capacity	0.01	0.06	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.1	0.0	13.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			37.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

58: H St & San Joaquin St




















4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	3	131	366	4	2	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.71	0.71	0.33	0.33
Hourly flow rate (vph)	3	146	515	6	6	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	521				671	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	521				671	518
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1045				421	557
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	149	521	12			
Volume Left	3	0	6			
Volume Right	0	6	6			
cSH	1045	1700	479			
Volume to Capacity	0.00	0.31	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.2	0.0	12.7			
Lane LOS	A		B			
Approach Delay (s)	0.2	0.0	12.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			29.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

59: E Divisadero St & N San Pablo Ave




















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	294	128	7	168	15	2	11	14	13	58	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.92		1.00	0.97	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3534	1583		3492		1770	1704		1770	1812	
Flt Permitted		0.95	1.00		0.94		0.69	1.00		0.74	1.00	
Satd. Flow (perm)		3348	1583		3284		1285	1704		1374	1812	
Peak-hour factor, PHF	0.64	0.64	0.64	0.91	0.91	0.91	0.84	0.84	0.84	0.68	0.68	0.68
Adj. Flow (vph)	14	459	200	8	185	16	2	13	17	19	85	19
RTOR Reduction (vph)	0	0	87	0	7	0	0	13	0	0	14	0
Lane Group Flow (vph)	0	473	113	0	202	0	2	17	0	19	90	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)		31.9	31.9		31.9		13.7	13.7		13.7	13.7	
Effective Green, g (s)		31.9	31.9		31.9		13.7	13.7		13.7	13.7	
Actuated g/C Ratio		0.57	0.57		0.57		0.24	0.24		0.24	0.24	
Clearance Time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1894	895		1857		312	414		334	440	
v/s Ratio Prot								0.01			c0.05	
v/s Ratio Perm		c0.14	0.07		0.06		0.00			0.01		
v/c Ratio		0.25	0.13		0.11		0.01	0.04		0.06	0.20	
Uniform Delay, d1		6.2	5.7		5.7		16.2	16.3		16.4	17.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		0.0		0.0	0.0		0.0	0.1	
Delay (s)		6.2	5.8		5.7		16.2	16.3		16.4	17.1	
Level of Service		A	A		A		B	B		B	B	
Approach Delay (s)		6.1			5.7			16.3			17.0	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			7.6				HCM Level of Service			A		
HCM Volume to Capacity ratio			0.24									
Actuated Cycle Length (s)			56.4				Sum of lost time (s)			10.8		
Intersection Capacity Utilization			80.0%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

59: E Divisadero St & N San Pablo Ave

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	231	33	5	339	30	18	20	22	15	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.92		1.00	0.94	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3529	1583		3494		1770	1717		1770	1742	
Flt Permitted		0.92	1.00		0.95		0.72	1.00		0.73	1.00	
Satd. Flow (perm)		3268	1583		3327		1348	1717		1357	1742	
Peak-hour factor, PHF	0.87	0.87	0.87	0.79	0.79	0.79	0.94	0.94	0.94	0.69	0.69	0.69
Adj. Flow (vph)	17	266	38	6	429	38	19	21	23	22	29	22
RTOR Reduction (vph)	0	0	15	0	8	0	0	19	0	0	18	0
Lane Group Flow (vph)	0	283	23	0	465	0	19	25	0	22	33	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)		32.6	32.6		32.6		9.4	9.4		9.4	9.4	
Effective Green, g (s)		32.6	32.6		32.6		9.4	9.4		9.4	9.4	
Actuated g/C Ratio		0.62	0.62		0.62		0.18	0.18		0.18	0.18	
Clearance Time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		2018	977		2054		240	306		242	310	
v/s Ratio Prot								0.01			c0.02	
v/s Ratio Perm		0.09	0.01		c0.14		0.01			0.02		
v/c Ratio		0.14	0.02		0.23		0.08	0.08		0.09	0.11	
Uniform Delay, d1		4.2	3.9		4.5		18.1	18.1		18.1	18.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		0.0		0.1	0.0		0.1	0.1	
Delay (s)		4.2	3.9		4.5		18.1	18.1		18.2	18.2	
Level of Service		A	A		A		B	B		B	B	
Approach Delay (s)		4.2			4.5			18.1			18.2	
Approach LOS		A			A			B			B	










Intersection Summary

HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	10.8
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

60: H St & Amador St










4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	5	425	62	7	37	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.64	0.64	0.76	0.76	0.65	0.65
Hourly flow rate (vph)	8	664	82	9	57	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	91				766	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	91				766	86
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				85	99
cM capacity (veh/h)	1504				369	973
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	672	91	66			
Volume Left	8	0	57			
Volume Right	0	9	9			
cSH	1504	1700	404			
Volume to Capacity	0.01	0.05	0.16			
Queue Length 95th (ft)	0	0	14			
Control Delay (s)	0.1	0.0	15.6			
Lane LOS	A		C			
Approach Delay (s)	0.1	0.0	15.6			
Approach LOS			C			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			36.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

60: H St & Amador St












4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	5	123	355	24	11	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.71	0.71	0.72	0.72
Hourly flow rate (vph)	5	135	500	34	15	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	534				663	517
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	534				663	517
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	96
cM capacity (veh/h)	1034				424	558
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	141	534	38			
Volume Left	5	0	15			
Volume Right	0	34	22			
cSH	1034	1700	494			
Volume to Capacity	0.01	0.31	0.08			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.4	0.0	12.9			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	12.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			30.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

61: E Divisadero St & G St











4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	43	29	107	13	4	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.5	4.0	4.9		4.9	4.9
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3482		1770	1863
Flt Permitted	1.00	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1863	1583	3482		1863	1863
Peak-hour factor, PHF	0.82	0.82	0.86	0.86	0.92	0.92
Adj. Flow (vph)	52	35	124	15	4	61
RTOR Reduction (vph)	0	35	11	0	0	0
Lane Group Flow (vph)	52	0	128	0	4	61
Turn Type		NA			Perm	
Protected Phases			2			2
Permitted Phases	4				2	
Actuated Green, G (s)	1.7	0.0	3.0		3.0	3.0
Effective Green, g (s)	1.7	0.0	3.0		3.0	3.0
Actuated g/C Ratio	0.12	0.00	0.21		0.21	0.21
Clearance Time (s)	4.5		4.9		4.9	4.9
Vehicle Extension (s)	5.0		4.0		4.0	4.0
Lane Grp Cap (vph)	225	0	741		396	396
v/s Ratio Prot			c0.04			0.03
v/s Ratio Perm	c0.03				0.00	
v/c Ratio	0.23	0.00	0.17		0.01	0.15
Uniform Delay, d1	5.6	7.0	4.5		4.4	4.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.1	0.0	0.2		0.0	0.2
Delay (s)	6.7	7.0	4.7		4.4	4.8
Level of Service	A	A	A		A	A
Approach Delay (s)	6.8		4.7			4.7
Approach LOS	A		A			A
Intersection Summary						
HCM Average Control Delay			5.3		HCM Level of Service	A
HCM Volume to Capacity ratio			0.19			
Actuated Cycle Length (s)			14.1		Sum of lost time (s)	9.4
Intersection Capacity Utilization			27.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

61: E Divisadero St & G St




















4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	62	15	57	9	16	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.5		4.9		4.9	4.9
Lane Util. Factor	1.00		0.95		1.00	1.00
Frt	0.97		0.98		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1744		3468		1770	1863
Flt Permitted	0.84		1.00		0.89	1.00
Satd. Flow (perm)	1528		3468		1656	1863
Peak-hour factor, PHF	0.77	0.77	0.88	0.88	0.90	0.90
Adj. Flow (vph)	81	19	65	10	18	74
RTOR Reduction (vph)	15	0	8	0	0	0
Lane Group Flow (vph)	85	0	67	0	18	74
Turn Type					Perm	
Protected Phases			2			2
Permitted Phases	4				2	
Actuated Green, G (s)	4.3		4.5		4.5	4.5
Effective Green, g (s)	4.3		4.5		4.5	4.5
Actuated g/C Ratio	0.24		0.25		0.25	0.25
Clearance Time (s)	4.5		4.9		4.9	4.9
Vehicle Extension (s)	5.0		4.0		4.0	4.0
Lane Grp Cap (vph)	361		857		409	461
v/s Ratio Prot			0.02			c0.04
v/s Ratio Perm	c0.06				0.01	
v/c Ratio	0.24		0.08		0.04	0.16
Uniform Delay, d1	5.6		5.3		5.2	5.4
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.7		0.1		0.1	0.2
Delay (s)	6.3		5.3		5.3	5.6
Level of Service	A		A		A	A
Approach Delay (s)	6.3		5.3			5.5
Approach LOS	A		A			A
Intersection Summary						
HCM Average Control Delay			5.8		HCM Level of Service	A
HCM Volume to Capacity ratio			0.20			
Actuated Cycle Length (s)			18.2		Sum of lost time (s)	9.4
Intersection Capacity Utilization			27.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St



4/25/2011

												
Movement	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBR2	SEL
Lane Configurations												
Volume (vph)	0	11	4	10	258	1	9	65	0	9	3	776
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6			4.6	4.6				4.6	4.6	4.2	4.6
Lane Util. Factor	1.00			0.95	0.95				0.95	1.00	1.00	0.97
Frt	0.86			0.87	0.85				1.00	0.85	0.86	0.95
Flt Protected	1.00			1.00	1.00				0.95	1.00	1.00	0.97
Satd. Flow (prot)	1611			1529	1504				3362	1583	1611	3320
Flt Permitted	1.00			1.00	1.00				0.95	1.00	1.00	0.46
Satd. Flow (perm)	1611			1524	1504				3362	1583	1611	1561
Peak-hour factor, PHF	0.84	0.84	0.83	0.83	0.83	0.83	0.86	0.86	0.86	0.86	0.75	0.71
Adj. Flow (vph)	0	13	5	12	311	1	10	76	0	10	4	1093
RTOR Reduction (vph)	9	0	0	0	0	0	0	0	0	9	4	0
Lane Group Flow (vph)	4	0	0	166	163	0	0	0	86	1	0	1652
Turn Type			Perm		Perm		Perm	Perm		Perm	custom	
Protected Phases	6			6					4		8	5
Permitted Phases			6		6		4	4		4		2
Actuated Green, G (s)	20.2			20.2	20.2				6.4	6.4	6.8	18.2
Effective Green, g (s)	20.2			20.2	20.2				6.4	6.4	6.8	18.2
Actuated g/C Ratio	0.34			0.34	0.34				0.11	0.11	0.12	0.31
Clearance Time (s)	4.6			4.6	4.6				4.6	4.6	4.2	4.6
Vehicle Extension (s)	5.0			5.0	5.0				4.0	4.0	2.0	5.0
Lane Grp Cap (vph)	555			525	518				367	173	187	1031
v/s Ratio Prot	0.00										0.00	c0.50
v/s Ratio Perm				c0.11	0.11				0.03	0.00		
v/c Ratio	0.01			0.32	0.31				0.23	0.01	0.00	1.60
Uniform Delay, d1	12.6			14.1	14.1				23.9	23.3	22.9	20.2
Progression Factor	1.00			1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0			0.7	0.7				0.4	0.0	0.0	275.6
Delay (s)	12.6			14.8	14.8				24.3	23.3	22.9	295.8
Level of Service	B			B	B				C	C	C	F
Approach Delay (s)	12.6			14.8					24.2			295.8
Approach LOS	B			B					C			F
Intersection Summary												
HCM Average Control Delay			236.9			HCM Level of Service			F			
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			58.6			Sum of lost time (s)			13.8			
Intersection Capacity Utilization			69.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St




















4/25/2011

Movement	SER	SER2
<div>   </div>		
Lane Configurations		
Volume (vph)	396	1
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.71	0.71
Adj. Flow (vph)	558	1
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St

4/25/2011

												
Movement	EBT	EBR	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBR2	SEL2	SEL
Lane Configurations												
Volume (vph)	0	9	7	522	2	4	302	0	19	6	1	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6		4.6	4.6				4.6	4.6	4.2		4.6
Lane Util. Factor	1.00		0.95	0.95				0.95	1.00	1.00		0.97
Frt	0.86		0.85	0.85				1.00	0.85	0.86		0.98
Flt Protected	1.00		1.00	1.00				0.95	1.00	1.00		0.96
Satd. Flow (prot)	1611		1511	1504				3362	1583	1611		3394
Flt Permitted	1.00		1.00	1.00				0.95	1.00	1.00		0.95
Satd. Flow (perm)	1611		1511	1504				3362	1583	1611		3381
Peak-hour factor, PHF	0.85	0.85	0.78	0.78	0.78	0.71	0.71	0.71	0.71	0.50	0.95	0.95
Adj. Flow (vph)	0	11	9	669	3	6	425	0	27	12	1	537
RTOR Reduction (vph)	8	0	0	1	0	0	0	0	23	10	0	0
Lane Group Flow (vph)	3	0	344	336	0	0	0	431	4	2	0	622
Turn Type			custom			Perm	Perm		Perm	custom	Perm	
Protected Phases	6		6	2				4		8		5
Permitted Phases				6		4	4		4		5	2
Actuated Green, G (s)	21.6		21.6	34.0				12.0	12.0	12.4		30.4
Effective Green, g (s)	21.6		21.6	34.0				12.0	12.0	12.4		30.4
Actuated g/C Ratio	0.26		0.26	0.41				0.15	0.15	0.15		0.37
Clearance Time (s)	4.6		4.6	4.6				4.6	4.6	4.2		4.6
Vehicle Extension (s)	5.0		5.0	5.0				4.0	4.0	2.0		5.0
Lane Grp Cap (vph)	422		396	621				490	231	242		1250
v/s Ratio Prot	0.00		c0.23	c0.08						0.00		c0.11
v/s Ratio Perm				0.14				0.13	0.00			0.07
v/c Ratio	0.01		0.87	0.54				1.67dl	0.02	0.01		0.50
Uniform Delay, d1	22.5		29.0	18.3				34.5	30.1	29.8		23.1
Progression Factor	1.00		1.00	1.00				1.00	1.00	1.00		1.00
Incremental Delay, d2	0.0		19.3	1.7				16.8	0.0	0.0		0.7
Delay (s)	22.5		48.4	20.0				51.3	30.2	29.8		23.7
Level of Service	C		D	C				D	C	C		C
Approach Delay (s)	22.5		34.3					50.0				23.7
Approach LOS	C		C					D				C

Intersection Summary

HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	18.4
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group




















63: E Divisadero St & N Echo St

Fresno - Existing plus Project Conditions - PM

HCM Signalized Intersection Capacity Analysis

64: E Divisadero St & Broadway St




















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	17	385	67	10	245	16	36	56	14	10	24	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.97		1.00	0.97	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3532	1583		3501		1770	1805		1770	1807	
Flt Permitted		0.94	1.00		0.94		0.73	1.00		0.71	1.00	
Satd. Flow (perm)		3321	1583		3290		1362	1805		1316	1807	
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.90	0.90	0.90	0.75	0.75	0.75
Adj. Flow (vph)	18	418	73	10	255	17	40	62	16	13	32	8
RTOR Reduction (vph)	0	0	38	0	9	0	0	12	0	0	6	0
Lane Group Flow (vph)	0	436	35	0	273	0	40	66	0	13	34	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Actuated Green, G (s)		15.9	15.9		15.9		7.8	7.8		7.8	7.8	
Effective Green, g (s)		15.9	15.9		15.9		7.8	7.8		7.8	7.8	
Actuated g/C Ratio		0.48	0.48		0.48		0.24	0.24		0.24	0.24	
Clearance Time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1605	765		1590		323	428		312	428	
v/s Ratio Prot								c0.04				0.02
v/s Ratio Perm		c0.13	0.02		0.08		0.03			0.01		
v/c Ratio		0.27	0.05		0.17		0.12	0.15		0.04	0.08	
Uniform Delay, d1		5.1	4.5		4.8		9.9	9.9		9.7	9.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		0.0		0.1	0.1		0.0	0.0	
Delay (s)		5.1	4.5		4.8		9.9	10.0		9.7	9.8	
Level of Service		A	A		A		A	A		A	A	
Approach Delay (s)		5.0			4.8			10.0			9.8	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			5.8			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.23									
Actuated Cycle Length (s)			32.9			Sum of lost time (s)				9.2		
Intersection Capacity Utilization			66.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

64: E Divisadero St & Broadway St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	22	225	29	5	401	54	26	22	19	81	91	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	0.93		1.00	0.99	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3524	1583		3475		1770	1734		1770	1842	
Flt Permitted		0.90	1.00		0.95		0.68	1.00		0.72	1.00	
Satd. Flow (perm)		3193	1583		3312		1263	1734		1349	1842	
Peak-hour factor, PHF	0.87	0.87	0.87	0.91	0.91	0.91	0.83	0.83	0.83	0.80	0.80	0.80
Adj. Flow (vph)	25	259	33	5	441	59	31	27	23	101	114	9
RTOR Reduction (vph)	0	0	16	0	19	0	0	17	0	0	6	0
Lane Group Flow (vph)	0	284	17	0	486	0	31	33	0	101	117	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Actuated Green, G (s)		23.3	23.3		23.3		12.7	12.7		12.7	12.7	
Effective Green, g (s)		23.3	23.3		23.3		12.7	12.7		12.7	12.7	
Actuated g/C Ratio		0.52	0.52		0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1646	816		1707		355	487		379	518	
v/s Ratio Prot								0.02			0.06	
v/s Ratio Perm		0.09	0.01		0.15		0.02			0.07		
v/c Ratio		0.17	0.02		0.28		0.09	0.07		0.27	0.22	
Uniform Delay, d1		5.8	5.4		6.2		12.0	11.9		12.6	12.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0		0.0		0.0	0.0		0.1	0.1	
Delay (s)		5.8	5.4		6.3		12.0	11.9		12.8	12.6	
Level of Service		A	A		A		B	B		B	B	
Approach Delay (s)		5.8			6.3			12.0			12.6	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			7.8				HCM Level of Service			A		
HCM Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			45.2				Sum of lost time (s)			9.2		
Intersection Capacity Utilization			66.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

65: E Divisadero St & N Fulton St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	472	18	8	134	0	9	0	16	255	505	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	0.95	
Frt		0.99			1.00		1.00		0.85	1.00	0.97	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3519			3529		1770		1583	1770	3420	
Flt Permitted		1.00			0.92		0.30		1.00	0.95	1.00	
Satd. Flow (perm)		3519			3260		568		1583	1770	3420	
Peak-hour factor, PHF	0.70	0.70	0.70	0.87	0.87	0.87	0.78	0.78	0.78	0.90	0.90	0.90
Adj. Flow (vph)	0	674	26	9	154	0	12	0	21	283	561	162
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	12	0	45	0
Lane Group Flow (vph)	0	695	0	0	163	0	12	0	9	283	678	0
Turn Type				Perm			D.Pm		custom		Perm	
Protected Phases		4			4				2		2	
Permitted Phases				4			2		2		2	
Actuated Green, G (s)		25.0			25.0		24.2		24.2	24.2	24.2	
Effective Green, g (s)		25.0			25.0		24.2		24.2	24.2	24.2	
Actuated g/C Ratio		0.43			0.43		0.42		0.42	0.42	0.42	
Clearance Time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Vehicle Extension (s)		2.0			2.0		2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)		1512			1400		236		658	736	1422	
v/s Ratio Prot		c0.20							0.01		c0.20	
v/s Ratio Perm					0.05		0.02			0.16		
v/c Ratio		0.46			0.12		0.05		0.01	0.38	0.48	
Uniform Delay, d1		11.8			10.0		10.1		10.0	11.8	12.4	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0		0.0	0.1	0.1	
Delay (s)		11.9			10.0		10.2		10.0	11.9	12.5	
Level of Service		B			A		B		A	B	B	
Approach Delay (s)		11.9			10.0			10.1			12.3	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay			11.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			58.2			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			72.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

65: E Divisadero St & N Fulton St
















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	237	22	7	360	0	12	0	30	122	221	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	0.95	
Frt		0.99			1.00		1.00		0.85	1.00	0.96	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3494			3536		1770		1583	1770	3402	
Flt Permitted		1.00			0.95		0.56		1.00	0.95	1.00	
Satd. Flow (perm)		3494			3359		1038		1583	1770	3402	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	0	249	23	8	396	0	14	0	34	131	238	83
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	20	0	49	0
Lane Group Flow (vph)	0	261	0	0	404	0	14	0	14	131	272	0
Turn Type				Perm			D.Pm		custom		Perm	
Protected Phases		4			4				2			2
Permitted Phases				4			2		2		2	
Actuated Green, G (s)		25.0			25.0		24.0		24.0	24.0	24.0	
Effective Green, g (s)		25.0			25.0		24.0		24.0	24.0	24.0	
Actuated g/C Ratio		0.43			0.43		0.41		0.41	0.41	0.41	
Clearance Time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Vehicle Extension (s)		2.0			2.0		2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)		1506			1448		430		655	732	1408	
v/s Ratio Prot		0.07							0.01		c0.08	
v/s Ratio Perm					c0.12		0.01			0.07		
v/c Ratio		0.17			0.28		0.03		0.02	0.18	0.19	
Uniform Delay, d1		10.1			10.7		10.1		10.1	10.8	10.8	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0		0.0	0.0	0.0	
Delay (s)		10.2			10.7		10.1		10.1	10.8	10.9	
Level of Service		B			B		B		B	B	B	
Approach Delay (s)		10.2			10.7			10.1			10.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			10.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.24									
Actuated Cycle Length (s)			58.0			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			72.1%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

66: E Divisadero St & N Van Ness Ave
















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	465	180	6	116	43	31	157	15	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5			4.2				
Lane Util. Factor		0.95			0.95			0.95				
Frt		0.96			0.96			0.99				
Flt Protected		1.00			1.00			0.99				
Satd. Flow (prot)		3390			3395			3473				
Flt Permitted		0.92			0.93			0.99				
Satd. Flow (perm)		3142			3147			3473				
Peak-hour factor, PHF	0.69	0.69	0.69	0.81	0.81	0.81	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	58	674	261	7	143	53	33	167	16	0	0	0
RTOR Reduction (vph)	0	57	0	0	29	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	936	0	0	174	0	0	206	0	0	0	0
Turn Type	Perm			Perm			Split					
Protected Phases		8			4		6	6				
Permitted Phases	8			4								
Actuated Green, G (s)		25.5			25.5			22.0				
Effective Green, g (s)		25.5			25.5			22.0				
Actuated g/C Ratio		0.45			0.45			0.39				
Clearance Time (s)		4.5			4.5			4.2				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		1426			1428			1360				
v/s Ratio Prot								c0.06				
v/s Ratio Perm		c0.30			0.06							
v/c Ratio		0.66			0.12			0.15				
Uniform Delay, d1		11.9			8.9			11.1				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.8			0.0			0.0				
Delay (s)		12.8			8.9			11.1				
Level of Service		B			A			B				
Approach Delay (s)		12.8			8.9			11.1			0.0	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM Average Control Delay			12.0			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			56.2			Sum of lost time (s)			8.7			
Intersection Capacity Utilization			74.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

66: E Divisadero St & N Van Ness Ave



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	221	61	9	306	105	123	537	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5			4.2				
Lane Util. Factor		0.95			0.95			0.95				
Frt		0.98			0.96			1.00				
Flt Protected		0.98			1.00			0.99				
Satd. Flow (prot)		3405			3403			3494				
Flt Permitted		0.63			0.94			0.99				
Satd. Flow (perm)		2166			3202			3494				
Peak-hour factor, PHF	0.70	0.70	0.70	0.70	0.70	0.70	0.62	0.62	0.62	0.92	0.92	0.92
Adj. Flow (vph)	220	316	87	13	437	150	198	866	27	0	0	0
RTOR Reduction (vph)	0	21	0	0	42	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	602	0	0	558	0	0	1088	0	0	0	0
Turn Type	Perm			Perm			Split					
Protected Phases		8			4		6	6				
Permitted Phases	8			4								
Actuated Green, G (s)		25.5			25.5			23.0				
Effective Green, g (s)		25.5			25.5			23.0				
Actuated g/C Ratio		0.45			0.45			0.40				
Clearance Time (s)		4.5			4.5			4.2				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		966			1427			1405				
v/s Ratio Prot								c0.31				
v/s Ratio Perm		c0.28			0.17							
v/c Ratio		0.62			0.39			0.77				
Uniform Delay, d1		12.2			10.6			14.8				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.9			0.1			2.5				
Delay (s)		13.1			10.7			17.3				
Level of Service		B			B			B				
Approach Delay (s)		13.1			10.7			17.3			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			14.5			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			57.2			Sum of lost time (s)			8.7			
Intersection Capacity Utilization			75.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

67: N Roosevelt Ave. & N H St



















4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	13	0	3	1	0	0	1	1174	24	24	297	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00		0.95	
Frt	1.00	0.85			1.00			1.00	0.85		1.00	
Flt Protected	0.95	1.00			0.95			1.00	1.00		1.00	
Satd. Flow (prot)	1770	1583			1770			3539	1583		3524	
Flt Permitted	1.00	1.00			1.00			0.95	1.00		0.85	
Satd. Flow (perm)	1863	1583			1863			3380	1583		3007	
Peak-hour factor, PHF	0.77	0.77	0.77	0.25	0.25	0.25	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	17	0	4	4	0	0	1	1381	28	27	330	1
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	5	0	0	0
Lane Group Flow (vph)	17	0	0	0	4	0	0	1382	23	0	358	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)	3.4	3.4			3.4			33.0	33.0		33.0	
Effective Green, g (s)	3.4	3.4			3.4			33.0	33.0		33.0	
Actuated g/C Ratio	0.08	0.08			0.08			0.73	0.73		0.73	
Clearance Time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Vehicle Extension (s)	5.0	5.0			5.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	140	119			140			2468	1156		2195	
v/s Ratio Prot		0.00										
v/s Ratio Perm	c0.01				0.00			c0.41	0.01		0.12	
v/c Ratio	0.12	0.00			0.03			0.56	0.02		0.16	
Uniform Delay, d1	19.5	19.3			19.4			2.8	1.7		1.9	
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.8	0.0			0.2			0.3	0.0		0.0	
Delay (s)	20.3	19.3			19.5			3.1	1.7		1.9	
Level of Service	C	B			B			A	A		A	
Approach Delay (s)		20.1			19.5			3.1			1.9	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM Average Control Delay			3.1		HCM Level of Service				A			
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			45.2		Sum of lost time (s)				8.8			
Intersection Capacity Utilization			63.8%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

67: N Roosevelt Ave. & N H St


















4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	24	0	2	0	1	0	1	622	17	16	698	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00		0.95	
Frt	1.00	0.85			1.00			1.00	0.85		1.00	
Flt Protected	0.95	1.00			1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1770	1583			1863			3539	1583		3535	
Flt Permitted	0.76	1.00			1.00			0.95	1.00		0.94	
Satd. Flow (perm)	1407	1583			1863			3377	1583		3323	
Peak-hour factor, PHF	0.90	0.90	0.90	0.25	0.25	0.25	0.97	0.97	0.97	0.79	0.79	0.79
Adj. Flow (vph)	27	0	2	0	4	0	1	641	18	20	884	1
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	6	0	0	0
Lane Group Flow (vph)	27	0	0	0	4	0	0	642	12	0	905	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)	7.3	7.3			7.3			30.4	30.4		30.4	
Effective Green, g (s)	7.3	7.3			7.3			30.4	30.4		30.4	
Actuated g/C Ratio	0.16	0.16			0.16			0.65	0.65		0.65	
Clearance Time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Vehicle Extension (s)	5.0	5.0			5.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	221	249			292			2208	1035		2172	
v/s Ratio Prot		0.00			0.00							
v/s Ratio Perm	c0.02							0.19	0.01		c0.27	
v/c Ratio	0.12	0.00			0.01			0.29	0.01		0.42	
Uniform Delay, d1	16.8	16.5			16.6			3.4	2.8		3.8	
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.5	0.0			0.0			0.1	0.0		0.2	
Delay (s)	17.4	16.5			16.6			3.5	2.8		4.0	
Level of Service	B	B			B			A	A		A	
Approach Delay (s)		17.3			16.6			3.5			4.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			4.1			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			46.5			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			61.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

68: E McKenzie Ave. & N Blackstone Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	52	27	33	35	0	0	0	0	81	1009	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.9	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1777			1818						5038	
Flt Permitted		1.00			0.80						1.00	
Satd. Flow (perm)		1777			1489						5038	
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.92	0.92	0.92	0.79	0.79	0.79
Adj. Flow (vph)	0	60	31	37	39	0	0	0	0	103	1277	54
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	69	0	0	76	0	0	0	0	0	1428	0
Turn Type				Perm						Split		
Protected Phases		8			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		6.6			6.6						23.2	
Effective Green, g (s)		6.6			6.6						23.2	
Actuated g/C Ratio		0.17			0.17						0.60	
Clearance Time (s)		4.2			4.2						4.9	
Vehicle Extension (s)		4.0			4.0						5.0	
Lane Grp Cap (vph)		301			253						3005	
v/s Ratio Prot		0.04									c0.28	
v/s Ratio Perm					c0.05							
v/c Ratio		0.23			0.30						0.48	
Uniform Delay, d1		14.0			14.1						4.4	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.5			0.9						0.2	
Delay (s)		14.5			15.0						4.7	
Level of Service		B			B						A	
Approach Delay (s)		14.5			15.0			0.0			4.7	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			5.7			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			38.9			Sum of lost time (s)			9.1			
Intersection Capacity Utilization			40.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

68: E McKenzie Ave. & N Blackstone Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	64	38	39	59	0	0	0	0	48	584	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.9	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.95			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1769			1827						5011	
Flt Permitted		1.00			0.81						1.00	
Satd. Flow (perm)		1769			1518						5011	
Peak-hour factor, PHF	0.77	0.77	0.77	0.79	0.79	0.79	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	83	49	49	75	0	0	0	0	54	656	57
RTOR Reduction (vph)	0	39	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	93	0	0	124	0	0	0	0	0	752	0
Turn Type				Perm						Split		
Protected Phases		8			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		7.5			7.5						20.8	
Effective Green, g (s)		7.5			7.5						20.8	
Actuated g/C Ratio		0.20			0.20						0.56	
Clearance Time (s)		4.2			4.2						4.9	
Vehicle Extension (s)		4.0			4.0						5.0	
Lane Grp Cap (vph)		355			304						2787	
v/s Ratio Prot		0.05									c0.15	
v/s Ratio Perm					c0.08							
v/c Ratio		0.26			0.41						0.27	
Uniform Delay, d1		12.6			13.0						4.3	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.5			1.2						0.1	
Delay (s)		13.2			14.2						4.4	
Level of Service		B			B						A	
Approach Delay (s)		13.2			14.2			0.0			4.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			6.8			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			37.4			Sum of lost time (s)				9.1		
Intersection Capacity Utilization			35.3%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

69: E McKenzie Ave. & N Abby St


















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	41	90	0	0	50	49	17	415	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2			4.9				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.93			0.99				
Flt Protected		0.98			1.00			1.00				
Satd. Flow (prot)		1834			1738			5038				
Flt Permitted		0.85			1.00			1.00				
Satd. Flow (perm)		1587			1738			5038				
Peak-hour factor, PHF	0.78	0.78	0.78	0.80	0.80	0.80	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	53	115	0	0	62	61	20	494	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	46	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	168	0	0	77	0	0	530	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		7.3			7.3			13.0				
Effective Green, g (s)		7.3			7.3			13.0				
Actuated g/C Ratio		0.25			0.25			0.44				
Clearance Time (s)		4.2			4.2			4.9				
Vehicle Extension (s)		4.0			4.0			0.2				
Lane Grp Cap (vph)		394			432			2228				
v/s Ratio Prot					0.04			0.11				
v/s Ratio Perm		0.11										
v/c Ratio		0.43			0.18			0.24				
Uniform Delay, d1		9.3			8.7			5.1				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		1.0			0.3			0.0				
Delay (s)		10.3			9.0			5.1				
Level of Service		B			A			A				
Approach Delay (s)		10.3			9.0			5.1			0.0	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.7			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			29.4			Sum of lost time (s)			9.1			
Intersection Capacity Utilization			37.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

69: E McKenzie Ave. & N Abby St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	51	64	0	0	78	109	20	1037	24	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2			4.9				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.92			1.00				
Flt Protected		0.98			1.00			1.00				
Satd. Flow (prot)		1822			1716			5064				
Flt Permitted		0.75			1.00			1.00				
Satd. Flow (perm)		1405			1716			5064				
Peak-hour factor, PHF	0.72	0.72	0.72	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	71	89	0	0	92	128	24	1220	28	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	160	0	0	204	0	0	1268	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		8.5			8.5			19.8				
Effective Green, g (s)		8.5			8.5			19.8				
Actuated g/C Ratio		0.23			0.23			0.53				
Clearance Time (s)		4.2			4.2			4.9				
Vehicle Extension (s)		4.0			4.0			0.2				
Lane Grp Cap (vph)		319			390			2681				
v/s Ratio Prot					c0.12			c0.25				
v/s Ratio Perm		0.11										
v/c Ratio		0.50			0.52			0.47				
Uniform Delay, d1		12.6			12.7			5.5				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		1.7			1.6			0.0				
Delay (s)		14.3			14.3			5.6				
Level of Service		B			B			A				
Approach Delay (s)		14.3			14.3			5.6			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			7.6			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			37.4			Sum of lost time (s)			9.1			
Intersection Capacity Utilization			49.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

70: 180 EB Off-Ramp & N Fulton St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  									  	
Volume (vph)	0	195	163	0	0	0	0	0	0	343	836	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2									4.6	
Lane Util. Factor		0.95									0.95	
Frt		0.93									1.00	
Flt Protected		1.00									0.99	
Satd. Flow (prot)		3298									3488	
Flt Permitted		1.00									0.99	
Satd. Flow (perm)		3298									3488	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.80	0.80	0.80
Adj. Flow (vph)	0	212	177	0	0	0	0	0	0	429	1045	0
RTOR Reduction (vph)	0	39	0	0	0	0	0	0	0	0	57	0
Lane Group Flow (vph)	0	350	0	0	0	0	0	0	0	0	1417	0
Turn Type										Perm		
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		15.5									30.5	
Effective Green, g (s)		15.5									30.5	
Actuated g/C Ratio		0.28									0.56	
Clearance Time (s)		4.2									4.6	
Vehicle Extension (s)		6.4									5.6	
Lane Grp Cap (vph)		933									1941	
v/s Ratio Prot		c0.11										
v/s Ratio Perm											0.41	
v/c Ratio		0.37									0.73	
Uniform Delay, d1		15.8									9.1	
Progression Factor		1.00									1.00	
Incremental Delay, d2		0.8									1.9	
Delay (s)		16.6									11.0	
Level of Service		B									B	
Approach Delay (s)		16.6			0.0			0.0			11.0	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM Average Control Delay			12.1				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			54.8				Sum of lost time (s)			8.8		
Intersection Capacity Utilization			51.0%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

70: 180 EB Off-Ramp & N Fulton St

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  									  	
Volume (vph)	0	219	122	0	0	0	0	0	0	355	316	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2									4.6	
Lane Util. Factor		0.95									0.95	
Frt		0.95									1.00	
Flt Protected		1.00									0.97	
Satd. Flow (prot)		3350									3448	
Flt Permitted		1.00									0.97	
Satd. Flow (perm)		3350									3448	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	261	145	0	0	0	0	0	0	413	367	0
RTOR Reduction (vph)	0	97	0	0	0	0	0	0	0	0	224	0
Lane Group Flow (vph)	0	309	0	0	0	0	0	0	0	0	556	0
Turn Type										Perm		
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		14.1									19.3	
Effective Green, g (s)		14.1									19.3	
Actuated g/C Ratio		0.33									0.46	
Clearance Time (s)		4.2									4.6	
Vehicle Extension (s)		6.4									5.6	
Lane Grp Cap (vph)		1119									1577	
v/s Ratio Prot		0.09									0.16	
v/s Ratio Perm											0.35	
v/c Ratio		0.28									7.4	
Uniform Delay, d1		10.3									1.00	
Progression Factor		1.00									0.3	
Incremental Delay, d2		0.4									7.8	
Delay (s)		10.7									A	
Level of Service		B									A	
Approach Delay (s)		10.7			0.0			0.0			7.8	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			8.8								A	
HCM Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			42.2							8.8		
Intersection Capacity Utilization			37.0%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

71: 180 EB On-Ramp & N Van Ness Ave

















4/25/2011

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations					 						
Volume (vph)	198	339	0	0	167	114	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6	4.6					
Lane Util. Factor	1.00	1.00			0.95	1.00					
Frt	1.00	1.00			1.00	0.85					
Flt Protected	0.95	0.95			1.00	1.00					
Satd. Flow (prot)	1770	1770			3539	1583					
Flt Permitted	0.95	0.95			1.00	1.00					
Satd. Flow (perm)	1770	1770			3539	1583					
Peak-hour factor, PHF	0.89	0.89	0.89	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	381	0	0	190	130	0	0	0	0	0
RTOR Reduction (vph)	139	0	0	0	0	93	0	0	0	0	0
Lane Group Flow (vph)	83	381	0	0	190	37	0	0	0	0	0
Turn Type	Split					Perm					
Protected Phases	4	4			2						
Permitted Phases						2					
Actuated Green, G (s)	9.9	9.9			7.5	7.5					
Effective Green, g (s)	9.9	9.9			7.5	7.5					
Actuated g/C Ratio	0.37	0.37			0.28	0.28					
Clearance Time (s)	4.6	4.6			4.6	4.6					
Vehicle Extension (s)	5.0	5.0			4.5	4.5					
Lane Grp Cap (vph)	659	659			998	446					
v/s Ratio Prot	0.05	0.22			0.05						
v/s Ratio Perm						0.02					
v/c Ratio	0.13	0.58			0.19	0.08					
Uniform Delay, d1	5.5	6.7			7.2	7.0					
Progression Factor	1.00	1.00			1.00	1.00					
Incremental Delay, d2	0.2	2.0			0.2	0.1					
Delay (s)	5.7	8.6			7.4	7.2					
Level of Service	A	A			A	A					
Approach Delay (s)		7.6			7.3		0.0			0.0	
Approach LOS		A			A		A			A	
Intersection Summary											
HCM Average Control Delay			7.5		HCM Level of Service				A		
HCM Volume to Capacity ratio			0.41								
Actuated Cycle Length (s)			26.6		Sum of lost time (s)				9.2		
Intersection Capacity Utilization			34.8%		ICU Level of Service				A		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

71: 180 EB On-Ramp & N Van Ness Ave













4/25/2011

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations					 						
Volume (vph)	188	360	0	0	413	392	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6	4.6					
Lane Util. Factor	1.00	1.00			0.95	1.00					
Frt	1.00	1.00			1.00	0.85					
Flt Protected	0.95	0.95			1.00	1.00					
Satd. Flow (prot)	1770	1770			3539	1583					
Flt Permitted	0.95	0.95			1.00	1.00					
Satd. Flow (perm)	1770	1770			3539	1583					
Peak-hour factor, PHF	0.85	0.85	0.85	0.70	0.70	0.70	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	221	424	0	0	590	560	0	0	0	0	0
RTOR Reduction (vph)	130	0	0	0	0	121	0	0	0	0	0
Lane Group Flow (vph)	91	424	0	0	590	439	0	0	0	0	0
Turn Type	Split					Perm					
Protected Phases	4	4			2						
Permitted Phases						2					
Actuated Green, G (s)	14.4	14.4			18.4	18.4					
Effective Green, g (s)	14.4	14.4			18.4	18.4					
Actuated g/C Ratio	0.34	0.34			0.44	0.44					
Clearance Time (s)	4.6	4.6			4.6	4.6					
Vehicle Extension (s)	5.0	5.0			4.5	4.5					
Lane Grp Cap (vph)	607	607			1550	694					
v/s Ratio Prot	0.05	c0.24			0.17						
v/s Ratio Perm						c0.28					
v/c Ratio	0.15	0.70			0.38	0.63					
Uniform Delay, d1	9.6	11.9			8.0	9.2					
Progression Factor	1.00	1.00			1.00	1.00					
Incremental Delay, d2	0.2	4.4			0.3	2.4					
Delay (s)	9.8	16.4			8.2	11.5					
Level of Service	A	B			A	B					
Approach Delay (s)		14.1			9.8		0.0			0.0	
Approach LOS		B			A		A			A	
Intersection Summary											
HCM Average Control Delay			11.4		HCM Level of Service				B		
HCM Volume to Capacity ratio			0.66								
Actuated Cycle Length (s)			42.0		Sum of lost time (s)				9.2		
Intersection Capacity Utilization			39.0%		ICU Level of Service				A		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

72: 180 WB Ramps & N Fulton St


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↑↑	
Volume (vph)	0	277	563	4	40	0	0	0	0	0	651	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.7	3.7		3.7						4.1	
Lane Util. Factor		1.00	1.00		1.00						0.95	
Flt		1.00	0.85		1.00						0.98	
Flt Protected		1.00	1.00		1.00						1.00	
Satd. Flow (prot)		1863	1583		1854						3451	
Flt Permitted		1.00	1.00		0.97						1.00	
Satd. Flow (perm)		1863	1583		1810						3451	
Peak-hour factor, PHF	0.82	0.82	0.82	0.50	0.50	0.50	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	338	687	8	80	0	0	0	0	0	748	149
RTOR Reduction (vph)	0	0	76	0	0	0	0	0	0	0	28	0
Lane Group Flow (vph)	0	338	611	0	88	0	0	0	0	0	869	0
Turn Type			Perm	Perm								
Protected Phases		4			8						6	
Permitted Phases			4	8								
Actuated Green, G (s)		26.2	26.2		26.2						25.1	
Effective Green, g (s)		26.2	26.2		26.2						25.1	
Actuated g/C Ratio		0.44	0.44		0.44						0.42	
Clearance Time (s)		3.7	3.7		3.7						4.1	
Vehicle Extension (s)		5.0	5.0		4.8						4.6	
Lane Grp Cap (vph)		826	702		802						1466	
v/s Ratio Prot		0.18									0.25	
v/s Ratio Perm			0.39		0.05							
v/c Ratio		0.41	0.87		0.11						0.59	
Uniform Delay, d1		11.2	14.9		9.6						13.1	
Progression Factor		1.00	1.00		1.00						1.00	
Incremental Delay, d2		0.7	12.1		0.1						0.9	
Delay (s)		11.9	27.0		9.7						14.0	
Level of Service		B	C		A						B	
Approach Delay (s)		22.0			9.7			0.0			14.0	
Approach LOS		C			A			A			B	
Intersection Summary												
HCM Average Control Delay			17.9			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			59.1			Sum of lost time (s)				7.8		
Intersection Capacity Utilization			73.8%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

72: 180 WB Ramps & N Fulton St









4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (vph)	0	327	175	7	78	0	0	0	0	0	500	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.7	3.7		3.7						4.1	
Lane Util. Factor		1.00	1.00		1.00						0.95	
Frt		1.00	0.85		1.00						0.97	
Flt Protected		1.00	1.00		1.00						1.00	
Satd. Flow (prot)		1863	1583		1855						3437	
Flt Permitted		1.00	1.00		0.97						1.00	
Satd. Flow (perm)		1863	1583		1805						3437	
Peak-hour factor, PHF	0.96	0.96	0.96	0.70	0.70	0.70	0.92	0.92	0.92	0.82	0.82	0.82
Adj. Flow (vph)	0	341	182	10	111	0	0	0	0	0	610	146
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	0	0	34	0
Lane Group Flow (vph)	0	341	69	0	121	0	0	0	0	0	722	0
Turn Type			Perm	Perm								
Protected Phases		4			8						6	
Permitted Phases			4	8								
Actuated Green, G (s)		17.1	17.1		17.1						20.0	
Effective Green, g (s)		17.1	17.1		17.1						20.0	
Actuated g/C Ratio		0.38	0.38		0.38						0.45	
Clearance Time (s)		3.7	3.7		3.7						4.1	
Vehicle Extension (s)		5.0	5.0		4.8						4.6	
Lane Grp Cap (vph)		710	603		687						1531	
v/s Ratio Prot		c0.18									c0.21	
v/s Ratio Perm			0.04		0.07							
v/c Ratio		0.48	0.11		0.18						0.47	
Uniform Delay, d1		10.5	9.0		9.2						8.7	
Progression Factor		1.00	1.00		1.00						1.00	
Incremental Delay, d2		1.1	0.2		0.2						0.4	
Delay (s)		11.6	9.2		9.5						9.2	
Level of Service		B	A		A						A	
Approach Delay (s)		10.8			9.5			0.0			9.2	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			9.8			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			44.9			Sum of lost time (s)				7.8		
Intersection Capacity Utilization			45.2%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

73: 180 WB Ramps & N Van Ness Ave









4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	288	0	56	344	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.6			4.6		
Lane Util. Factor	1.00			0.95		
Frt	1.00			1.00		
Flt Protected	0.95			0.99		
Satd. Flow (prot)	1770			3515		
Flt Permitted	0.95			0.99		
Satd. Flow (perm)	1770			3515		
Peak-hour factor, PHF	0.87	0.87	0.85	0.85	0.92	0.92
Adj. Flow (vph)	331	0	66	405	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	331	0	0	471	0	0
Turn Type			Split			
Protected Phases	4		2	2		
Permitted Phases						
Actuated Green, G (s)	12.3			13.8		
Effective Green, g (s)	12.3			13.8		
Actuated g/C Ratio	0.35			0.39		
Clearance Time (s)	4.6			4.6		
Vehicle Extension (s)	3.3			4.9		
Lane Grp Cap (vph)	617			1374		
v/s Ratio Prot	c0.19			c0.13		
v/s Ratio Perm						
v/c Ratio	0.54			0.34		
Uniform Delay, d1	9.2			7.6		
Progression Factor	1.00			1.00		
Incremental Delay, d2	1.0			0.3		
Delay (s)	10.2			7.9		
Level of Service	B			A		
Approach Delay (s)	10.2			7.9	0.0	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			8.8	HCM Level of Service		A
HCM Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			35.3	Sum of lost time (s)		9.2
Intersection Capacity Utilization			34.8%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

73: 180 WB Ramps & N Van Ness Ave

















4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	325	0	85	564	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.6			4.6		
Lane Util. Factor	1.00			0.95		
Frt	1.00			1.00		
Flt Protected	0.95			0.99		
Satd. Flow (prot)	1770			3516		
Flt Permitted	0.95			0.99		
Satd. Flow (perm)	1770			3516		
Peak-hour factor, PHF	0.96	0.96	0.72	0.72	0.92	0.92
Adj. Flow (vph)	339	0	118	783	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	339	0	0	901	0	0
Turn Type			Split			
Protected Phases	4		2	2		
Permitted Phases						
Actuated Green, G (s)	15.1			23.7		
Effective Green, g (s)	15.1			23.7		
Actuated g/C Ratio	0.31			0.49		
Clearance Time (s)	4.6			4.6		
Vehicle Extension (s)	3.3			4.9		
Lane Grp Cap (vph)	557			1736		
v/s Ratio Prot	c0.19			c0.26		
v/s Ratio Perm						
v/c Ratio	0.61			0.52		
Uniform Delay, d1	13.9			8.3		
Progression Factor	1.00			1.00		
Incremental Delay, d2	1.9			0.5		
Delay (s)	15.9			8.8		
Level of Service	B			A		
Approach Delay (s)	15.9			8.8	0.0	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			10.7	HCM Level of Service		B
HCM Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			48.0	Sum of lost time (s)		9.2
Intersection Capacity Utilization			43.7%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

74: E Belmont Ave. & N Blackstone Ave













4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	283	48	89	180	0	0	0	0	149	1014	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	
Lane Util. Factor		0.95		1.00	0.95						0.91	
Frt		0.98		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		3463		1770	3539						4986	
Flt Permitted		1.00		0.95	1.00						0.99	
Satd. Flow (perm)		3463		1770	3539						4986	
Peak-hour factor, PHF	0.90	0.90	0.90	0.77	0.77	0.77	0.92	0.92	0.92	0.79	0.79	0.79
Adj. Flow (vph)	0	314	53	116	234	0	0	0	0	189	1284	149
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	352	0	116	234	0	0	0	0	0	1610	0
Turn Type				Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases												
Actuated Green, G (s)		17.3		7.3	28.3						26.9	
Effective Green, g (s)		17.3		7.3	28.3						26.9	
Actuated g/C Ratio		0.27		0.11	0.44						0.42	
Clearance Time (s)		4.2		3.7	4.2						4.9	
Vehicle Extension (s)		6.8		2.0	6.8						0.2	
Lane Grp Cap (vph)		932		201	1558						2086	
v/s Ratio Prot		c0.10		c0.07	0.07						c0.32	
v/s Ratio Perm												
v/c Ratio		0.38		0.58	0.15						0.77	
Uniform Delay, d1		19.1		27.0	10.8						16.1	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.9		2.5	0.2						1.7	
Delay (s)		20.0		29.5	10.9						17.7	
Level of Service		B		C	B						B	
Approach Delay (s)		20.0			17.1			0.0			17.7	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM Average Control Delay			18.0			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			64.3			Sum of lost time (s)				12.8		
Intersection Capacity Utilization			50.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

74: E Belmont Ave. & N Blackstone Ave























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↵	↑↑						↑↑↑	
Volume (vph)	0	450	33	83	296	0	0	0	0	171	581	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	
Lane Util. Factor		0.95		1.00	0.95						0.91	
Frt		0.99		1.00	1.00						0.98	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		3503		1770	3539						4933	
Flt Permitted		1.00		0.95	1.00						0.99	
Satd. Flow (perm)		3503		1770	3539						4933	
Peak-hour factor, PHF	0.97	0.97	0.97	0.83	0.83	0.83	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	464	34	100	357	0	0	0	0	192	653	133
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	24	0
Lane Group Flow (vph)	0	493	0	100	357	0	0	0	0	0	954	0
Turn Type				Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases												
Actuated Green, G (s)		19.5		6.6	29.8						20.0	
Effective Green, g (s)		19.5		6.6	29.8						20.0	
Actuated g/C Ratio		0.33		0.11	0.51						0.34	
Clearance Time (s)		4.2		3.7	4.2						4.9	
Vehicle Extension (s)		6.8		2.0	6.8						0.2	
Lane Grp Cap (vph)		1160		198	1791						1675	
v/s Ratio Prot		c0.14		c0.06	0.10						c0.19	
v/s Ratio Perm												
v/c Ratio		0.42		0.51	0.20						0.57	
Uniform Delay, d1		15.3		24.6	8.0						15.9	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.9		0.7	0.2						0.3	
Delay (s)		16.2		25.4	8.2						16.2	
Level of Service		B		C	A						B	
Approach Delay (s)		16.2			11.9			0.0			16.2	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM Average Control Delay			15.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			58.9			Sum of lost time (s)				12.8		
Intersection Capacity Utilization			51.1%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

75: E Belmont Ave. & N Abby St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			  				
Volume (vph)	124	309	0	0	245	100	23	441	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		5073	1583			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		5073	1583			
Peak-hour factor, PHF	0.88	0.88	0.88	0.81	0.81	0.81	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	141	351	0	0	302	123	25	485	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	92	0	0	17	0	0	0
Lane Group Flow (vph)	141	351	0	0	302	31	0	510	10	0	0	0
Turn Type	Prot					Perm	Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	7.3	24.2			13.2	13.2		19.6	19.6			
Effective Green, g (s)	7.3	24.2			13.2	13.2		19.6	19.6			
Actuated g/C Ratio	0.14	0.46			0.25	0.25		0.37	0.37			
Clearance Time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	2.0	5.1			5.1	5.1		0.2	0.2			
Lane Grp Cap (vph)	244	1619			883	395		1880	587			
v/s Ratio Prot	c0.08	0.10			c0.09			c0.10				
v/s Ratio Perm						0.02			0.01			
v/c Ratio	0.58	0.22			0.34	0.08		0.27	0.02			
Uniform Delay, d1	21.4	8.6			16.3	15.2		11.7	10.5			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.1	0.1			0.5	0.2		0.0	0.0			
Delay (s)	23.4	8.8			16.8	15.4		11.7	10.6			
Level of Service	C	A			B	B		B	B			
Approach Delay (s)		13.0			16.4			11.6			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			13.5				HCM Level of Service		B			
HCM Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			52.9				Sum of lost time (s)		12.8			
Intersection Capacity Utilization			50.5%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

75: E Belmont Ave. & N Abby St





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	490	0	0	341	92	33	1181	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		5078	1583			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		5078	1583			
Peak-hour factor, PHF	0.95	0.95	0.95	0.84	0.84	0.84	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	138	516	0	0	406	110	38	1373	24	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	80	0	0	14	0	0	0
Lane Group Flow (vph)	138	516	0	0	406	30	0	1411	10	0	0	0
Turn Type	Prot					Perm	Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	8.1	28.8			17.0	17.0		23.7	23.7			
Effective Green, g (s)	8.1	28.8			17.0	17.0		23.7	23.7			
Actuated g/C Ratio	0.13	0.47			0.28	0.28		0.38	0.38			
Clearance Time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	2.0	5.1			5.1	5.1		0.2	0.2			
Lane Grp Cap (vph)	233	1655			977	437		1954	609			
v/s Ratio Prot	c0.08	0.15			c0.11			c0.28				
v/s Ratio Perm						0.02			0.01			
v/c Ratio	0.59	0.31			0.42	0.07		0.72	0.02			
Uniform Delay, d1	25.2	10.2			18.2	16.5		16.1	11.7			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.7	0.2			0.6	0.1		1.1	0.0			
Delay (s)	27.9	10.5			18.9	16.6		17.3	11.7			
Level of Service	C	B			B	B		B	B			
Approach Delay (s)		14.1			18.4			17.2			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			16.7				HCM Level of Service		B			
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			61.6				Sum of lost time (s)		12.8			
Intersection Capacity Utilization			51.1%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

76: Fresno St. &





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	206	34	111	295	38	31	183	29	68	353	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3464		1770	3479		1770	3467		1770	3463	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3464		1770	3479		1770	3467		1770	3463	
Peak-hour factor, PHF	0.85	0.85	0.85	0.84	0.84	0.84	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	65	242	40	132	351	45	43	254	40	94	490	82
RTOR Reduction (vph)	0	15	0	0	10	0	0	13	0	0	12	0
Lane Group Flow (vph)	65	267	0	132	386	0	43	281	0	94	560	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	4.5	15.5		7.5	18.5		3.9	15.7		6.6	28.4	
Effective Green, g (s)	4.5	15.5		7.5	18.5		3.9	15.7		6.6	28.4	
Actuated g/C Ratio	0.06	0.21		0.10	0.26		0.05	0.22		0.09	0.39	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	110	741		183	888		95	751		161	1357	
v/s Ratio Prot	0.04	0.08		c0.07	c0.11		0.02	0.08		c0.05	c0.16	
v/s Ratio Perm												
v/c Ratio	0.59	0.36		0.72	0.43		0.45	0.37		0.58	0.41	
Uniform Delay, d1	33.1	24.3		31.5	22.6		33.3	24.2		31.6	16.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	0.6		11.2	0.7		1.2	0.7		3.5	0.4	
Delay (s)	38.7	24.9		42.7	23.3		34.5	24.9		35.1	16.4	
Level of Service	D	C		D	C		C	C		D	B	
Approach Delay (s)		27.5			28.2			26.1			19.1	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay			24.4			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			72.5			Sum of lost time (s)			17.2			
Intersection Capacity Utilization			45.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

76: Fresno St. &

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	443	53	89	368	82	53	396	85	102	232	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3483		1770	3443		1770	3446		1770	3405	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3483		1770	3443		1770	3446		1770	3405	
Peak-hour factor, PHF	0.94	0.94	0.94	0.85	0.85	0.85	0.77	0.77	0.77	0.88	0.88	0.88
Adj. Flow (vph)	76	471	56	105	433	96	69	514	110	116	264	89
RTOR Reduction (vph)	0	10	0	0	20	0	0	18	0	0	31	0
Lane Group Flow (vph)	76	517	0	105	509	0	69	606	0	116	322	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.6	20.7		7.4	21.5		6.3	19.2		7.6	30.5	
Effective Green, g (s)	6.6	20.7		7.4	21.5		6.3	19.2		7.6	30.5	
Actuated g/C Ratio	0.08	0.25		0.09	0.26		0.08	0.23		0.09	0.37	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	142	878		160	902		136	806		164	1265	
v/s Ratio Prot	0.04	c0.15		c0.06	0.15		0.04	c0.18		c0.07	0.09	
v/s Ratio Perm												
v/c Ratio	0.54	0.59		0.66	0.56		0.51	0.75		0.71	0.25	
Uniform Delay, d1	36.3	27.0		36.1	26.2		36.4	29.2		36.2	17.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.6		7.2	1.3		1.1	4.7		10.8	0.2	
Delay (s)	38.2	28.5		43.3	27.6		37.5	34.0		47.0	18.1	
Level of Service	D	C		D	C		D	C		D	B	
Approach Delay (s)		29.8			30.2			34.3			25.3	
Approach LOS		C			C			C			C	























Intersection Summary

HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	27.2
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

77: Belmont Street & First Street























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	220	74	92	291	91	115	336	39	79	388	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3413		1770	3484		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3413		1770	3484		1770	3539	1583
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.80	0.80	0.80	0.78	0.78	0.78
Adj. Flow (vph)	77	265	89	100	316	99	144	420	49	101	497	103
RTOR Reduction (vph)	0	0	69	0	38	0	0	10	0	0	0	75
Lane Group Flow (vph)	77	265	20	100	377	0	144	459	0	101	497	28
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4									2
Actuated Green, G (s)	5.8	14.5	14.5	6.4	15.1		7.4	17.9		6.5	17.0	17.0
Effective Green, g (s)	5.8	14.5	14.5	6.4	15.1		7.4	17.9		6.5	17.0	17.0
Actuated g/C Ratio	0.09	0.23	0.23	0.10	0.24		0.12	0.28		0.10	0.27	0.27
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)	163	813	364	180	817		208	988		182	953	426
v/s Ratio Prot	0.04	0.07		c0.06	c0.11		c0.08	0.13		0.06	c0.14	
v/s Ratio Perm			0.01									0.02
v/c Ratio	0.47	0.33	0.06	0.56	0.46		0.69	0.46		0.55	0.52	0.07
Uniform Delay, d1	27.2	20.2	19.0	27.0	20.5		26.8	18.6		26.9	19.6	17.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.4	0.1	2.1	0.7		7.8	0.7		2.1	1.0	0.1
Delay (s)	28.0	20.6	19.1	29.1	21.2		34.5	19.4		29.0	20.6	17.3
Level of Service	C	C	B	C	C		C	B		C	C	B
Approach Delay (s)		21.6			22.8			22.9			21.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			22.1			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			63.1			Sum of lost time (s)			12.9			
Intersection Capacity Utilization			46.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

77: Belmont Street & First Street

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	126	459	127	112	372	153	109	570	52	131	430	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3385		1770	3495		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3385		1770	3495		1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.87	0.87	0.87	0.91	0.91	0.91	0.85	0.85	0.85
Adj. Flow (vph)	131	478	132	129	428	176	120	626	57	154	506	94
RTOR Reduction (vph)	0	0	96	0	54	0	0	8	0	0	0	68
Lane Group Flow (vph)	131	478	36	129	550	0	120	675	0	154	506	26
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4									2
Actuated Green, G (s)	7.5	19.5	19.5	7.5	19.5		7.3	19.0		7.9	19.6	19.6
Effective Green, g (s)	7.5	19.5	19.5	7.5	19.5		7.3	19.0		7.9	19.6	19.6
Actuated g/C Ratio	0.10	0.27	0.27	0.10	0.27		0.10	0.26		0.11	0.27	0.27
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)	185	962	431	185	921		180	926		195	967	433
v/s Ratio Prot	c0.07	0.14		0.07	c0.16		0.07	c0.19		c0.09	0.14	
v/s Ratio Perm			0.02									0.02
v/c Ratio	0.71	0.50	0.08	0.70	0.60		0.67	0.73		0.79	0.52	0.06
Uniform Delay, d1	31.0	22.0	19.4	31.0	22.7		31.0	24.0		31.1	22.1	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.7	0.7	0.1	8.9	1.4		7.0	3.6		17.5	1.0	0.1
Delay (s)	40.7	22.7	19.6	39.9	24.1		38.1	27.6		48.6	23.1	19.4
Level of Service	D	C	B	D	C		D	C		D	C	B
Approach Delay (s)		25.3			26.9			29.1			27.8	
Approach LOS		C			C			C			C	











Intersection Summary

HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	17.8
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis









78: CA 180 EB & N Blackstone Ave

4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						  
Volume (vph)	128	0	0	0	173	1160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.2					4.9
Lane Util. Factor	1.00					0.91
Frt	1.00					1.00
Flt Protected	0.95					0.99
Satd. Flow (prot)	1770					5053
Flt Permitted	0.95					0.99
Satd. Flow (perm)	1770					5053
Peak-hour factor, PHF	0.59	0.59	0.92	0.92	0.82	0.82
Adj. Flow (vph)	217	0	0	0	211	1415
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	217	0	0	0	0	1626
Turn Type					Split	
Protected Phases	8				6	6
Permitted Phases						
Actuated Green, G (s)	13.1					30.2
Effective Green, g (s)	13.1					30.2
Actuated g/C Ratio	0.25					0.58
Clearance Time (s)	4.2					4.9
Vehicle Extension (s)	4.8					5.4
Lane Grp Cap (vph)	443					2912
v/s Ratio Prot	c0.12					c0.32
v/s Ratio Perm						
v/c Ratio	0.49					0.56
Uniform Delay, d1	16.8					6.9
Progression Factor	1.00					1.00
Incremental Delay, d2	1.7					0.4
Delay (s)	18.5					7.4
Level of Service	B					A
Approach Delay (s)	18.5		0.0			7.4
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			8.7		HCM Level of Service	A
HCM Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			52.4		Sum of lost time (s)	9.1
Intersection Capacity Utilization			40.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis 78: CA 180 EB & N Blackstone Ave





















4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	99	0	0	0	246	779
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.2					4.9
Lane Util. Factor	1.00					0.91
Frt	1.00					1.00
Flt Protected	0.95					0.99
Satd. Flow (prot)	1770					5025
Flt Permitted	0.95					0.99
Satd. Flow (perm)	1770					5025
Peak-hour factor, PHF	0.75	0.75	0.92	0.92	0.89	0.89
Adj. Flow (vph)	132	0	0	0	276	875
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	132	0	0	0	0	1151
Turn Type					Split	
Protected Phases	8				6	6
Permitted Phases						
Actuated Green, G (s)	8.1					27.2
Effective Green, g (s)	8.1					27.2
Actuated g/C Ratio	0.18					0.61
Clearance Time (s)	4.2					4.9
Vehicle Extension (s)	4.8					5.4
Lane Grp Cap (vph)	323					3078
v/s Ratio Prot	c0.07					c0.23
v/s Ratio Perm						
v/c Ratio	0.41					0.37
Uniform Delay, d1	16.0					4.3
Progression Factor	1.00					1.00
Incremental Delay, d2	1.6					0.2
Delay (s)	17.7					4.5
Level of Service	B					A
Approach Delay (s)	17.7		0.0			4.5
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			5.9		HCM Level of Service	A
HCM Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			44.4		Sum of lost time (s)	9.1
Intersection Capacity Utilization			79.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

79: CA 180 EB & N Abby St





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	7	170	0	0	128	217	2	406	260	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	1863			1863	1583		5084	1583			
Flt Permitted	0.64	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1196	1863			1863	1583		5084	1583			
Peak-hour factor, PHF	0.79	0.79	0.79	0.70	0.70	0.70	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	215	0	0	183	310	2	441	283	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	185	0	0	174	0	0	0
Lane Group Flow (vph)	9	215	0	0	183	125	0	443	109	0	0	0
Turn Type	Perm					Perm	Split		Perm			
Protected Phases		4			4		2	2				
Permitted Phases	4					4			2			
Actuated Green, G (s)	17.5	17.5			17.5	17.5		16.7	16.7			
Effective Green, g (s)	17.5	17.5			17.5	17.5		16.7	16.7			
Actuated g/C Ratio	0.40	0.40			0.40	0.40		0.39	0.39			
Clearance Time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	5.7	5.7			5.7	5.7		5.2	5.2			
Lane Grp Cap (vph)	483	753			753	640		1961	611			
v/s Ratio Prot		c0.12			0.10			c0.09				
v/s Ratio Perm	0.01					0.08			0.07			
v/c Ratio	0.02	0.29			0.24	0.20		0.23	0.18			
Uniform Delay, d1	7.7	8.7			8.5	8.3		9.0	8.8			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.0	0.5			0.4	0.4		0.1	0.3			
Delay (s)	7.8	9.2			9.0	8.7		9.1	9.1			
Level of Service	A	A			A	A		A	A			
Approach Delay (s)		9.2			8.8			9.1			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			9.0				HCM Level of Service		A			
HCM Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			43.3				Sum of lost time (s)		9.1			
Intersection Capacity Utilization			40.6%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

79: CA 180 EB & N Abby St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	17	233	0	0	98	192	0	832	578	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	1863			1863	1583		5085	1583			
Flt Permitted	0.68	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1266	1863			1863	1583		5085	1583			
Peak-hour factor, PHF	0.87	0.87	0.87	0.82	0.82	0.82	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	20	268	0	0	120	234	0	945	657	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	224	0	0	0
Lane Group Flow (vph)	20	268	0	0	120	186	0	945	433	0	0	0
Turn Type	Perm					Perm	Split		Perm			
Protected Phases		4			4		2	2				
Permitted Phases	4					4			2			
Actuated Green, G (s)	18.8	18.8			18.8	18.8		29.1	29.1			
Effective Green, g (s)	18.8	18.8			18.8	18.8		29.1	29.1			
Actuated g/C Ratio	0.33	0.33			0.33	0.33		0.51	0.51			
Clearance Time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	5.7	5.7			5.7	5.7		5.2	5.2			
Lane Grp Cap (vph)	418	614			614	522		2596	808			
v/s Ratio Prot		c0.14			0.06			0.19				
v/s Ratio Perm	0.02					0.12			c0.27			
v/c Ratio	0.05	0.44			0.20	0.36		0.36	0.54			
Uniform Delay, d1	13.0	15.0			13.7	14.5		8.4	9.4			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.1	1.3			0.4	1.1		0.2	1.3			
Delay (s)	13.1	16.2			14.1	15.6		8.6	10.7			
Level of Service	B	B			B	B		A	B			
Approach Delay (s)		16.0			15.1			9.5			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			11.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			57.0			Sum of lost time (s)			9.1			
Intersection Capacity Utilization			65.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

80: CA 180 WB & N Blackstone Ave



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (vph)	0	322	710	5	72	0	0	0	0	3	628	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	4.9
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frt		0.91		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1690		1770	1863						3538	1583
Flt Permitted		1.00		0.95	1.00						1.00	1.00
Satd. Flow (perm)		1690		1770	1863						3538	1583
Peak-hour factor, PHF	0.82	0.82	0.82	0.84	0.84	0.84	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	0	393	866	6	86	0	0	0	0	4	757	134
RTOR Reduction (vph)	0	74	0	0	0	0	0	0	0	0	0	82
Lane Group Flow (vph)	0	1185	0	6	86	0	0	0	0	0	761	52
Turn Type				Prot						Split		Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		26.2		1.0	30.9						25.0	25.0
Effective Green, g (s)		26.2		1.0	30.9						25.0	25.0
Actuated g/C Ratio		0.40		0.02	0.48						0.38	0.38
Clearance Time (s)		4.2		3.7	4.2						4.9	4.9
Vehicle Extension (s)		4.9		2.0	4.6						5.2	5.2
Lane Grp Cap (vph)		681		27	886						1361	609
v/s Ratio Prot		c0.70		c0.00	0.05						c0.22	
v/s Ratio Perm												0.03
v/c Ratio		1.74		0.22	0.10						0.56	0.08
Uniform Delay, d1		19.4		31.6	9.4						15.7	12.7
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		339.1		1.5	0.1						0.9	0.1
Delay (s)		358.5		33.1	9.5						16.6	12.9
Level of Service		F		C	A						B	B
Approach Delay (s)		358.5			11.0			0.0			16.0	
Approach LOS		F			B			A			B	
Intersection Summary												
HCM Average Control Delay			207.8			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)			12.8			
Intersection Capacity Utilization			85.6%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

80: CA 180 WB & N Blackstone Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (vph)	0	194	313	13	121	0	0	0	0	3	691	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	4.9
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frt		0.92		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1708		1770	1863						3539	1583
Flt Permitted		1.00		0.95	1.00						1.00	1.00
Satd. Flow (perm)		1708		1770	1863						3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.74	0.74	0.74	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	216	348	18	164	0	0	0	0	3	803	186
RTOR Reduction (vph)	0	55	0	0	0	0	0	0	0	0	0	112
Lane Group Flow (vph)	0	509	0	18	164	0	0	0	0	0	806	74
Turn Type				Prot						Split		Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		26.1		1.1	30.9						26.5	26.5
Effective Green, g (s)		26.1		1.1	30.9						26.5	26.5
Actuated g/C Ratio		0.39		0.02	0.46						0.40	0.40
Clearance Time (s)		4.2		3.7	4.2						4.9	4.9
Vehicle Extension (s)		4.9		2.0	4.6						5.2	5.2
Lane Grp Cap (vph)		670		29	866						1410	631
v/s Ratio Prot		c0.30		c0.01	0.09						c0.23	
v/s Ratio Perm												0.05
v/c Ratio		0.76		0.62	0.19						0.57	0.12
Uniform Delay, d1		17.5		32.5	10.4						15.6	12.6
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		5.9		26.1	0.2						0.9	0.2
Delay (s)		23.4		58.6	10.6						16.5	12.8
Level of Service		C		E	B						B	B
Approach Delay (s)		23.4			15.4			0.0			15.8	
Approach LOS		C			B			A			B	
Intersection Summary												
HCM Average Control Delay			18.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			66.5			Sum of lost time (s)			12.8			
Intersection Capacity Utilization			56.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

81: Broadway St & Amador St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	7	125	17	2	17	6	5	14	1	9	24	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.78	0.78	0.78	0.67	0.67	0.67	0.75	0.75	0.75
Hourly flow rate (vph)	7	132	18	3	22	8	7	21	1	12	32	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1300										
pX, platoon unblocked												
vC, conflicting volume	29			149			206	190	75	123	195	26
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	29			149			206	190	75	123	195	26
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	97	100	99	95	100
cM capacity (veh/h)	1582			1429			701	699	972	814	695	1044
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	73	84	32	30	48							
Volume Left	7	0	3	7	12							
Volume Right	0	18	8	1	4							
cSH	1582	1700	1429	710	743							
Volume to Capacity	0.00	0.05	0.00	0.04	0.06							
Queue Length 95th (ft)	0	0	0	3	5							
Control Delay (s)	0.8	0.0	0.6	10.3	10.2							
Lane LOS	A		A	B	B							
Approach Delay (s)	0.4		0.6	10.3	10.2							
Approach LOS				B	B							
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			15.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

81: Broadway St & Amador St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	3	60	16	5	94	0	14	18	1	10	6	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.63	0.63	0.63	0.67	0.67	0.67	0.58	0.58	0.58
Hourly flow rate (vph)	4	80	21	8	149	0	21	27	1	17	10	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1300										
pX, platoon unblocked												
vC, conflicting volume	149			101			278	264	51	228	274	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	149			101			278	264	51	228	274	149
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	96	100	97	98	99
cM capacity (veh/h)	1430			1489			634	635	1007	680	626	871
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	44	61	157	49	36							
Volume Left	4	0	8	21	17							
Volume Right	0	21	0	1	9							
cSH	1430	1700	1489	642	699							
Volume to Capacity	0.00	0.04	0.01	0.08	0.05							
Queue Length 95th (ft)	0	0	0	6	4							
Control Delay (s)	0.7	0.0	0.4	11.1	10.4							
Lane LOS	A		A	B	B							
Approach Delay (s)	0.3		0.4	11.1	10.4							
Approach LOS				B	B							
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			19.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

82: Broadway St & San Joaquin St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	4	124	7	3	22	5	0	6	5	8	7	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.83	0.83	0.83	0.55	0.55	0.55	0.47	0.47	0.47
Hourly flow rate (vph)	4	132	7	4	27	6	0	11	9	17	15	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					1008							
pX, platoon unblocked												
vC, conflicting volume	33			139			193	184	70	126	185	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			139			193	184	70	126	185	30
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	99	98	98	100
cM capacity (veh/h)	1578			1442			732	706	979	814	705	1038
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	70	73	36	20	36							
Volume Left	4	0	4	0	17							
Volume Right	0	7	6	9	4							
cSH	1578	1700	1442	808	784							
Volume to Capacity	0.00	0.04	0.00	0.02	0.05							
Queue Length 95th (ft)	0	0	0	2	4							
Control Delay (s)	0.5	0.0	0.8	9.6	9.8							
Lane LOS	A		A	A	A							
Approach Delay (s)	0.2		0.8	9.6	9.8							
Approach LOS				A	A							
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			18.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

82: Broadway St & San Joaquin St























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	9	63	4	5	90	4	1	20	2	14	9	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.59	0.59	0.59	0.72	0.72	0.72	0.68	0.68	0.68
Hourly flow rate (vph)	13	90	6	8	153	7	1	28	3	21	13	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					1008							
pX, platoon unblocked												
vC, conflicting volume	159			96			308	295	48	260	294	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159			96			308	295	48	260	294	156
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	95	100	97	98	99
cM capacity (veh/h)	1418			1496			597	606	1011	639	607	862
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	58	51	168	32	44							
Volume Left	13	0	8	1	21							
Volume Right	0	6	7	3	10							
cSH	1418	1700	1496	628	669							
Volume to Capacity	0.01	0.03	0.01	0.05	0.07							
Queue Length 95th (ft)	1	0	0	4	5							
Control Delay (s)	1.7	0.0	0.4	11.0	10.8							
Lane LOS	A		A	B	B							
Approach Delay (s)	0.9		0.4	11.0	10.8							
Approach LOS				B	B							
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			23.5%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

83: F St & Fresno St























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	8	9	4	15	12	1	77	838	12	21	284	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	2049	1742	1947	2049	1742	1947	3885		1947	3881	
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.55	1.00		0.29	1.00	
Satd. Flow (perm)	1522	2049	1742	1536	2049	1742	1132	3885		594	3881	
Peak-hour factor, PHF	0.75	0.75	0.75	0.54	0.54	0.54	0.89	0.89	0.89	0.88	0.88	0.88
Adj. Flow (vph)	11	12	5	28	22	2	87	942	13	24	323	7
RTOR Reduction (vph)	0	0	4	0	0	2	0	2	0	0	3	0
Lane Group Flow (vph)	11	12	1	28	22	0	87	953	0	24	327	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	6.1	6.1	6.1	6.1	6.1	6.1	13.8	13.8		13.8	13.8	
Effective Green, g (s)	6.1	6.1	6.1	6.1	6.1	6.1	13.8	13.8		13.8	13.8	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.49	0.49		0.49	0.49	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	333	448	381	336	448	381	560	1922		294	1920	
v/s Ratio Prot		0.01			0.01			0.025			0.08	
v/s Ratio Perm	0.01		0.00	0.02		0.00	0.08			0.04		
v/c Ratio	0.03	0.03	0.00	0.08	0.05	0.00	0.16	0.50		0.08	0.17	
Uniform Delay, d1	8.6	8.6	8.5	8.7	8.6	8.5	3.9	4.7		3.7	3.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2		0.1	0.0	
Delay (s)	8.6	8.6	8.5	8.8	8.7	8.5	4.0	4.9		3.8	3.9	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		8.6			8.7			4.8			3.9	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			4.8							A		
HCM Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			27.9							8.0		
Intersection Capacity Utilization			44.4%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis










83: F st & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	15	28	22	42	38	5	71	405	27	32	812	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	2049	1742	1947	2049	1742	1947	3857		1947	3881	
Flt Permitted	0.73	1.00	1.00	0.73	1.00	1.00	0.29	1.00		0.44	1.00	
Satd. Flow (perm)	1491	2049	1742	1505	2049	1742	590	3857		905	3881	
Peak-hour factor, PHF	0.81	0.81	0.81	0.85	0.85	0.85	0.77	0.77	0.77	0.86	0.86	0.86
Adj. Flow (vph)	19	35	27	49	45	6	92	526	35	37	944	20
RTOR Reduction (vph)	0	0	21	0	0	5	0	10	0	0	3	0
Lane Group Flow (vph)	19	35	6	49	45	1	92	551	0	37	961	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	6.5	6.5	6.5	6.5	6.5	6.5	13.9	13.9		13.9	13.9	
Effective Green, g (s)	6.5	6.5	6.5	6.5	6.5	6.5	13.9	13.9		13.9	13.9	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.23	0.49	0.49		0.49	0.49	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	341	469	399	344	469	399	289	1888		443	1900	
v/s Ratio Prot		0.02			0.02			0.14			c0.25	
v/s Ratio Perm	0.01		0.00	c0.03		0.00	0.16			0.04		
w/c Ratio	0.06	0.07	0.02	0.14	0.10	0.00	0.32	0.29		0.08	0.51	
Uniform Delay, d1	8.6	8.6	8.5	8.7	8.6	8.5	4.4	4.3		3.9	4.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.2	0.1	0.0	0.6	0.1		0.1	0.2	
Delay (s)	8.6	8.7	8.5	8.9	8.7	8.5	5.0	4.4		3.9	5.1	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		8.6			8.8			4.5			5.1	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			5.2									
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			28.4									
Intersection Capacity Utilization			45.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 84: G St & Mono Street










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	96	2	2	136	1	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.96	0.96	0.50	0.92
Hourly flow rate (vph)	119	2	2	142	2	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1009			513		
pX, platoon unblocked						
vC, conflicting volume			121		266	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		266	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1467		722	932
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	121	144	9			
Volume Left	0	2	2			
Volume Right	2	0	7			
cSH	1700	1467	872			
Volume to Capacity	0.07	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.1	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

84: G St &

















4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	118	0	1	166	4	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.82	0.82	0.88	0.88
Hourly flow rate (vph)	137	0	1	202	5	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1009			513		
pX, platoon unblocked						
vC, conflicting volume			137		342	137
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		342	137
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			1447		654	911
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	137	204	19			
Volume Left	0	1	5			
Volume Right	0	0	15			
cSH	1700	1447	834			
Volume to Capacity	0.08	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			19.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

85: H St &

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	29	61	9	3	124	5	7	4	2	1	5	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.87	0.87	0.87	0.65	0.65	0.65	0.75	0.75	0.75
Hourly flow rate (vph)	35	73	11	3	143	6	11	6	3	1	7	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		496										
pX, platoon unblocked												
vC, conflicting volume	148			84			336	304	79	307	307	145
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			84			336	304	79	307	307	145
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	99	100	100	99	96
cM capacity (veh/h)	1433			1512			578	593	982	625	591	902
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	119	152	20	40								
Volume Left	35	3	11	1								
Volume Right	11	6	3	32								
cSH	1433	1512	622	818								
Volume to Capacity	0.02	0.00	0.03	0.05								
Queue Length 95th (ft)	2	0	2	4								
Control Delay (s)	2.4	0.2	11.0	9.6								
Lane LOS	A	A	B	A								
Approach Delay (s)	2.4	0.2	11.0	9.6								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			26.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

85: H St &



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	71	104	8	2	46	7	4	9	2	1	14	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.86	0.86	0.86	0.54	0.54	0.54	0.82	0.82	0.82
Hourly flow rate (vph)	89	130	10	2	53	8	7	17	4	1	17	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		487										
pX, platoon unblocked												
vC, conflicting volume	62			140			393	379	135	387	380	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			140			393	379	135	387	380	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	97	100	100	97	99
cM capacity (veh/h)	1541			1443			522	521	914	531	520	1009
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	229	64	28	28								
Volume Left	89	2	7	1								
Volume Right	10	8	4	10								
cSH	1541	1443	553	626								
Volume to Capacity	0.06	0.00	0.05	0.04								
Queue Length 95th (ft)	5	0	4	4								
Control Delay (s)	3.2	0.3	11.9	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.2	0.3	11.9	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			26.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

86: H St & Ventura Ave



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	16	29	17	9	2	71	563	10	3	381	104
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.78	0.78	0.78	0.83	0.83	0.83	0.92	0.92	0.92
Hourly flow rate (vph)	34	18	33	22	12	3	86	678	12	3	414	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								713			458	
pX, platoon unblocked	0.95	0.95	0.95	0.95	0.95	1.00	0.95			1.00		
vC, conflicting volume	996	1339	264	1111	1389	345	527			690		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	884	1243	125	1004	1296	337	402			683		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	88	96	86	92	100	92			100		
cM capacity (veh/h)	201	152	858	154	141	657	1098			903		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	84	36	86	452	238	3	276	251				
Volume Left	34	22	86	0	0	3	0	0				
Volume Right	33	3	0	0	12	0	0	113				
cSH	260	158	1098	1700	1700	903	1700	1700				
Volume to Capacity	0.32	0.23	0.08	0.27	0.14	0.00	0.16	0.15				
Queue Length 95th (ft)	34	21	6	0	0	0	0	0				
Control Delay (s)	25.4	34.5	8.6	0.0	0.0	9.0	0.0	0.0				
Lane LOS	D	D	A			A						
Approach Delay (s)	25.4	34.5	0.9			0.1						
Approach LOS	D	D										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			33.8%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis


















86: H St & Ventura Ave

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	68	8	71	14	8	10	42	477	14	2	577	43
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.73	0.73	0.73	0.91	0.91	0.91	0.77	0.77	0.77
Hourly flow rate (vph)	83	10	87	19	11	14	46	524	15	3	749	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								698			474	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1156	1414	403	1096	1435	270	805			540		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	795	1104	0	722	1128	270	375			540		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	60	94	90	91	93	98	95			100		
cM capacity (veh/h)	209	167	907	218	161	728	987			1025		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	179	44	46	349	190	3	500	306				
Volume Left	83	19	46	0	0	3	0	0				
Volume Right	87	14	0	0	15	0	0	56				
cSH	325	251	987	1700	1700	1025	1700	1700				
Volume to Capacity	0.55	0.17	0.05	0.21	0.11	0.00	0.29	0.18				
Queue Length 95th (ft)	79	15	4	0	0	0	0	0				
Control Delay (s)	28.9	22.3	8.8	0.0	0.0	8.5	0.0	0.0				
Lane LOS	D	C	A			A						
Approach Delay (s)	28.9	22.3	0.7			0.0						
Approach LOS	D	C										
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			41.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 87: O St & Santa Clara Street


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	22	12	0	107	0	0	0	0	214	100	608
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.92	0.92	0.92	0.85	0.85	0.85
Hourly flow rate (vph)	0	24	13	0	120	0	0	0	0	252	118	715
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total (vph)	37	120	0	369	715							
Volume Left (vph)	0	0	0	252	0							
Volume Right (vph)	13	0	0	0	715							
Hadj (s)	-0.18	0.03	0.00	0.17	-0.57							
Departure Headway (s)	4.8	4.9	4.7	4.5	3.2							
Degree Utilization, x	0.05	0.16	0.00	0.46	0.64							
Capacity (veh/h)	683	687	721	780	1119							
Control Delay (s)	8.0	8.8	7.7	11.2	11.6							
Approach Delay (s)	8.0	8.8	0.0	11.5								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay			11.1									
HCM Level of Service			B									
Intersection Capacity Utilization			49.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

87: O St & Santa Clara Street

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	111	24	0	223	0	0	0	6	211	17	135
Peak Hour Factor	0.76	0.76	0.76	0.78	0.78	0.78	0.50	0.50	0.50	0.88	0.88	0.88
Hourly flow rate (vph)	0	146	32	0	286	0	0	0	12	240	19	153
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total (vph)	178	286	12	259	153							
Volume Left (vph)	0	0	0	240	0							
Volume Right (vph)	32	0	12	0	153							
Hadj (s)	-0.07	0.03	-0.57	0.22	-0.57							
Departure Headway (s)	5.0	4.9	5.0	5.3	3.2							
Degree Utilization, x	0.25	0.39	0.02	0.38	0.14							
Capacity (veh/h)	674	695	622	634	1121							
Control Delay (s)	9.6	11.1	8.0	11.6	6.7							
Approach Delay (s)	9.6	11.1	8.0	9.8								
Approach LOS	A	B	A	A								
Intersection Summary												
Delay			10.1									
HCM Level of Service			B									
Intersection Capacity Utilization			33.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

89: M St &

















5/23/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	71	94	0	0	0	171	0	108	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.86	0.86	0.86	0.85	0.85	0.85	0.92	0.92	0.92
Hourly flow rate (vph)	86	113	0	0	0	199	0	127	13	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1075										
pX, platoon unblocked												
vC, conflicting volume	0			113			384	284	57	304	284	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			113			384	284	57	304	284	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	78	99	100	100	100
cM capacity (veh/h)	1622			1474			527	591	998	495	591	1084
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NE 1	NE 2						
Volume Total	86	57	57	199	85	55						
Volume Left	86	0	0	0	0	0						
Volume Right	0	0	0	199	0	13						
cSH	1622	1700	1700	1700	591	653						
Volume to Capacity	0.05	0.03	0.03	0.12	0.14	0.08						
Queue Length 95th (ft)	4	0	0	0	12	7						
Control Delay (s)	7.3	0.0	0.0	0.0	12.1	11.0						
Lane LOS	A				B	B						
Approach Delay (s)	3.2			0.0	11.7							
Approach LOS					B							
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			27.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

89: M St &

















5/23/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	553	100	0	0	0	251	0	146	31	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.83	0.83	0.83	0.83	0.83	0.83	0.92	0.92	0.92
Hourly flow rate (vph)	643	116	0	0	0	302	0	176	37	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			116			1554	1402	58	1469	1402	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			116			1554	1402	58	1469	1402	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	60			100			100	0	96	0	100	100
cM capacity (veh/h)	1622			1470			53	84	996	0	84	1084
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NE 1	NE 2						
Volume Total	643	58	58	302	117	96						
Volume Left	643	0	0	0	0	0						
Volume Right	0	0	0	302	0	37						
cSH	1622	1700	1700	1700	84	130						
Volume to Capacity	0.40	0.03	0.03	0.18	1.40	0.74						
Queue Length 95th (ft)	49	0	0	0	226	106						
Control Delay (s)	8.7	0.0	0.0	0.0	325.8	86.2						
Lane LOS	A				F	F						
Approach Delay (s)	7.3			0.0	218.0							
Approach LOS					F							
Intersection Summary												
Average Delay			40.8									
Intersection Capacity Utilization			53.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

90: Broadway St &

















5/23/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	78	242	3	4	62	35	3	5	12	60	5	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.66	0.66	0.66	0.71	0.71	0.71	0.66	0.66	0.66
Hourly flow rate (vph)	100	310	4	6	94	53	4	7	17	91	8	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		488										
pX, platoon unblocked												
vC, conflicting volume	147			314			674	671	157	508	647	120
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	147			314			674	671	157	508	647	120
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			99	98	98	78	98	97
cM capacity (veh/h)	1432			1243			307	348	860	408	360	908
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	255	159	153	28	124							
Volume Left	100	0	6	4	91							
Volume Right	0	4	53	17	26							
cSH	1432	1700	1243	525	456							
Volume to Capacity	0.07	0.09	0.00	0.05	0.27							
Queue Length 95th (ft)	6	0	0	4	27							
Control Delay (s)	3.4	0.0	0.4	12.2	15.8							
Lane LOS	A		A	B	C							
Approach Delay (s)	2.1		0.4	12.2	15.8							
Approach LOS				B	C							
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			30.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

90: Broadway St & Santa Clara Street


















5/23/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	15	131	0	2	37	21	1	3	4	71	27	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.83	0.83	0.83	0.67	0.67	0.67	0.83	0.83	0.83
Hourly flow rate (vph)	21	187	0	2	45	25	1	4	6	86	33	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		490										
pX, platoon unblocked												
vC, conflicting volume	70			187			344	305	94	207	292	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	70			187			344	305	94	207	292	57
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	99	88	95	96
cM capacity (veh/h)	1529			1385			535	598	945	715	608	997
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	115	94	72	12	154							
Volume Left	21	0	2	1	86							
Volume Right	0	0	25	6	36							
cSH	1529	1700	1385	719	736							
Volume to Capacity	0.01	0.06	0.00	0.02	0.21							
Queue Length 95th (ft)	1	0	0	1	20							
Control Delay (s)	1.5	0.0	0.3	10.1	11.2							
Lane LOS	A		A	B	B							
Approach Delay (s)	0.8		0.3	10.1	11.2							
Approach LOS				B	B							
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			28.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

91: E Hamilton Ave & Van Ness Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	4	6	0	21	4	96	8	44	171	9
Peak Hour Factor	0.40	0.40	0.40	0.84	0.84	0.84	0.79	0.79	0.79	0.84	0.84	0.84
Hourly flow rate (vph)	5	5	10	7	0	25	5	122	10	52	204	11
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	20	7	25	137	267							
Volume Left (vph)	5	7	0	5	52							
Volume Right (vph)	10	0	25	10	11							
Hadj (s)	-0.22	0.23	-0.57	0.00	0.05							
Departure Headway (s)	4.6	5.0	3.2	4.2	4.2							
Degree Utilization, x	0.03	0.01	0.02	0.16	0.31							
Capacity (veh/h)	715	651	1121	830	856							
Control Delay (s)	7.7	8.1	6.3	8.0	9.0							
Approach Delay (s)	7.7	6.7		8.0	9.0							
Approach LOS	A	A		A	A							
Intersection Summary												
Delay			8.5									
HCM Level of Service			A									
Intersection Capacity Utilization			28.6%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

91: E Hamilton Ave & Van Ness Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	12	3	1	18	1	59	5	130	16	32	136	10
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.88	0.88	0.88	0.84	0.84	0.84
Hourly flow rate (vph)	18	4	1	27	1	88	6	148	18	38	162	12
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	24	28	88	172	212							
Volume Left (vph)	18	27	0	6	38							
Volume Right (vph)	1	0	88	18	12							
Hadj (s)	0.15	0.22	-0.57	-0.02	0.04							
Departure Headway (s)	4.9	5.0	3.2	4.2	4.2							
Degree Utilization, x	0.03	0.04	0.08	0.20	0.25							
Capacity (veh/h)	667	658	1121	828	832							
Control Delay (s)	8.1	8.2	6.5	8.3	8.7							
Approach Delay (s)	8.1	6.9		8.3	8.7							
Approach LOS	A	A		A	A							
Intersection Summary												
Delay			8.1									
HCM Level of Service			A									
Intersection Capacity Utilization			35.2%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

92: E California Ave & Van Ness Ave

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	3	2	3	4	8	4	100	8	139	140	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.94	0.94	0.94	0.82	0.82	0.82	0.86	0.86	0.86
Hourly flow rate (vph)	2	6	4	3	4	9	5	122	10	162	163	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	659	653	188	655	674	127	214			132		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	659	653	188	655	674	127	214			132		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	99	99	99	100			89		
cM capacity (veh/h)	338	342	854	340	333	923	1356			1453		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	16	137	376								
Volume Left	2	3	5	162								
Volume Right	4	9	10	51								
cSH	427	509	1356	1453								
Volume to Capacity	0.03	0.03	0.00	0.11								
Queue Length 95th (ft)	2	2	0	9								
Control Delay (s)	13.7	12.3	0.3	3.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	13.7	12.3	0.3	3.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			34.4%		ICU Level of Service					A		
Analysis Period (min)			15									


























92: E California Ave & Van Ness Ave

[illegible]

HCM Signalized Intersection Capacity Analysis

96: E Church Ave & Golden State Blvd























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		 						 			 	
Volume (vph)	34	153	45	29	151	178	249	177	44	51	239	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	3893	1742	1947	2049	1742	1947	3777		1947	3749	
Flt Permitted	0.65	1.00	1.00	0.61	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1324	3893	1742	1241	2049	1742	1947	3777		1947	3749	
Peak-hour factor, PHF	0.65	0.65	0.65	0.86	0.86	0.86	0.76	0.76	0.76	0.91	0.91	0.91
Adj. Flow (vph)	52	235	69	34	176	207	328	233	58	56	263	86
RTOR Reduction (vph)	0	0	52	0	0	157	0	32	0	0	61	0
Lane Group Flow (vph)	52	235	17	34	176	50	328	259	0	56	288	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4						
Actuated Green, G (s)	10.9	10.9	10.9	10.9	10.9	10.9	10.8	20.4		1.7	11.3	
Effective Green, g (s)	10.9	10.9	10.9	10.9	10.9	10.9	10.8	20.4		1.7	11.3	
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.45		0.04	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	321	943	422	301	496	422	467	1712		74	941	
v/s Ratio Prot		0.06			c0.09		c0.17	0.07		0.03	c0.08	
v/s Ratio Perm	0.04		0.01	0.03		0.03						
v/c Ratio	0.16	0.25	0.04	0.11	0.35	0.12	0.70	0.15		0.76	0.31	
Uniform Delay, d1	13.4	13.8	13.0	13.3	14.1	13.3	15.6	7.2		21.4	13.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1	0.0	0.2	0.4	0.1	4.7	0.0		35.0	0.2	
Delay (s)	13.7	13.9	13.1	13.5	14.6	13.4	20.4	7.3		56.4	13.9	
Level of Service	B	B	B	B	B	B	C	A		E	B	
Approach Delay (s)		13.7			13.9			14.2			19.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			15.3				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			45.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			47.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

96: E Church Ave & Golden State Blvd











4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	65	202	37	31	210	266	228	131	29	59	249	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	3893	1742	1947	2049	1742	1947	3787		1947	3699	
Flt Permitted	0.55	1.00	1.00	0.62	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1133	3893	1742	1267	2049	1742	1947	3787		1947	3699	
Peak-hour factor, PHF	0.95	0.95	0.95	0.82	0.82	0.82	0.91	0.91	0.91	0.75	0.75	0.75
Adj. Flow (vph)	68	213	39	38	256	324	251	144	32	79	332	165
RTOR Reduction (vph)	0	0	28	0	0	231	0	21	0	0	119	0
Lane Group Flow (vph)	68	213	11	38	256	93	251	155	0	79	378	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4						
Actuated Green, G (s)	12.0	12.0	12.0	12.0	12.0	12.0	6.2	14.7		3.2	11.7	
Effective Green, g (s)	12.0	12.0	12.0	12.0	12.0	12.0	6.2	14.7		3.2	11.7	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.15	0.35		0.08	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	324	1115	499	363	587	499	288	1329		149	1033	
v/s Ratio Prot		0.05			c0.12		c0.13	c0.04		0.04	c0.10	
v/s Ratio Perm	0.06		0.01	0.03		0.05						
v/c Ratio	0.21	0.19	0.02	0.10	0.44	0.19	0.87	0.12		0.53	0.37	
Uniform Delay, d1	11.4	11.3	10.7	11.0	12.2	11.3	17.5	9.2		18.6	12.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1	0.0	0.1	0.5	0.2	23.8	0.0		3.6	0.2	
Delay (s)	11.7	11.4	10.8	11.1	12.7	11.4	41.3	9.2		22.2	12.3	
Level of Service	B	B	B	B	B	B	D	A		C	B	
Approach Delay (s)		11.4			12.0			28.1			13.7	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay			15.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			41.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			51.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis











98: E Chruch Ave & S East Ave

4/28/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	137	306	282	17	13	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.90	0.90	0.84	0.84
Hourly flow rate (vph)	178	397	313	19	15	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		446				
pX, platoon unblocked						
vC, conflicting volume	332				877	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	332				877	166
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				94	94
cM capacity (veh/h)	1224				246	849
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	178	199	199	209	123	68
Volume Left	178	0	0	0	0	15
Volume Right	0	0	0	0	19	52
cSH	1224	1700	1700	1700	1700	544
Volume to Capacity	0.15	0.12	0.12	0.12	0.07	0.12
Queue Length 95th (ft)	13	0	0	0	0	11
Control Delay (s)	8.4	0.0	0.0	0.0	0.0	12.6
Lane LOS	A					B
Approach Delay (s)	2.6			0.0		12.6
Approach LOS						B
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			29.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
98: E Chruch Ave & S East Ave

















4/28/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	207	445	357	21	16	88
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.84	0.84
Hourly flow rate (vph)	246	530	401	24	19	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		446				
pX, platoon unblocked						
vC, conflicting volume	425				1171	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	425				1171	212
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	78				87	87
cM capacity (veh/h)	1131				145	793
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	246	265	265	267	157	124
Volume Left	246	0	0	0	0	19
Volume Right	0	0	0	0	24	105
cSH	1131	1700	1700	1700	1700	470
Volume to Capacity	0.22	0.16	0.16	0.16	0.09	0.26
Queue Length 95th (ft)	21	0	0	0	0	26
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	15.4
Lane LOS	A					C
Approach Delay (s)	2.9			0.0		15.4
Approach LOS						C
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			38.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

99: E Church Ave & S Sunland Ave

















4/28/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	261	20	10	279	1	16	1	2	0	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.68	0.68	0.68	0.25	0.25	0.25
Hourly flow rate (vph)	4	353	27	12	332	1	24	1	3	0	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		715										
pX, platoon unblocked												
vC, conflicting volume	333			380			580	731	190	545	744	167
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			380			580	731	190	545	744	167
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			94	100	100	100	100	98
cM capacity (veh/h)	1223			1175			386	342	820	414	336	848
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	180	203	178	167	28	16						
Volume Left	4	0	12	0	24	0						
Volume Right	0	27	0	1	3	16						
cSH	1223	1700	1175	1700	406	848						
Volume to Capacity	0.00	0.12	0.01	0.10	0.07	0.02						
Queue Length 95th (ft)	0	0	1	0	6	1						
Control Delay (s)	0.2	0.0	0.6	0.0	14.5	9.3						
Lane LOS	A		A		B	A						
Approach Delay (s)	0.1		0.3		14.5	9.3						
Approach LOS					B	A						
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			29.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

99: E Church Ave & S Sunland Ave























4/28/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	381	16	1	356	0	24	0	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.88	0.88	0.88	0.50	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	0	448	19	1	405	0	48	0	4	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	405			467			662	864	234	635	874	202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	405			467			662	864	234	635	874	202
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			86	100	99	100	100	100
cM capacity (veh/h)	1151			1091			347	290	768	361	286	805
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	224	243	203	202	52	0						
Volume Left	0	0	1	0	48	0						
Volume Right	0	19	0	0	4	0						
cSH	1151	1700	1091	1700	362	1700						
Volume to Capacity	0.00	0.14	0.00	0.12	0.14	0.00						
Queue Length 95th (ft)	0	0	0	0	12	0						
Control Delay (s)	0.0	0.0	0.1	0.0	16.6	0.0						
Lane LOS			A		C	A						
Approach Delay (s)	0.0		0.0		16.6	0.0						
Approach LOS					C	A						
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			21.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

101: S East Ave & Golden State Blvd

4/28/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	15	38	4	13	29	6	6	169	50	14	323	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1947	2018		1947	1994		1947	3893	1742	1947	3893	1742
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1947	2018		1947	1994		1947	3893	1742	1947	3893	1742
Peak-hour factor, PHF	0.71	0.71	0.71	0.63	0.63	0.63	0.82	0.82	0.82	0.91	0.91	0.91
Adj. Flow (vph)	21	54	6	21	46	10	7	206	61	15	355	21
RTOR Reduction (vph)	0	5	0	0	8	0	0	0	45	0	0	15
Lane Group Flow (vph)	21	55	0	21	48	0	7	206	16	15	355	6
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	0.8	7.0		0.8	7.0		0.7	8.8	8.8	0.7	8.8	8.8
Effective Green, g (s)	0.8	7.0		0.8	7.0		0.7	8.8	8.8	0.7	8.8	8.8
Actuated g/C Ratio	0.02	0.21		0.02	0.21		0.02	0.26	0.26	0.02	0.26	0.26
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	47	424		47	419		41	1029	460	41	1029	460
v/s Ratio Prot	c0.01	c0.03		0.01	0.02		0.00	0.05		c0.01	c0.09	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.45	0.13		0.45	0.11		0.17	0.20	0.04	0.37	0.34	0.01
Uniform Delay, d1	16.0	10.7		16.0	10.6		16.0	9.5	9.1	16.1	9.9	9.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1		6.6	0.1		2.0	0.1	0.0	5.5	0.2	0.0
Delay (s)	22.7	10.8		22.7	10.8		18.0	9.6	9.1	21.5	10.1	9.1
Level of Service	C	B		C	B		B	A	A	C	B	A
Approach Delay (s)		13.9			14.0			9.7			10.5	
Approach LOS		B			B			A			B	























Intersection Summary

HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	33.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

101: S East Ave & Golden State Blvd

4/28/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	65	25	5	19	37	6	1	163	37	4	395	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1947	1996		1947	2006		1947	3893	1742	1947	3893	1742
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1947	1996		1947	2006		1947	3893	1742	1947	3893	1742
Peak-hour factor, PHF	0.85	0.85	0.85	0.60	0.60	0.60	0.81	0.81	0.81	0.99	0.99	0.99
Adj. Flow (vph)	76	29	6	32	62	10	1	201	46	4	399	25
RTOR Reduction (vph)	0	4	0	0	8	0	0	0	34	0	0	18
Lane Group Flow (vph)	76	31	0	32	64	0	1	201	12	4	399	7
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	1.7	9.2		0.5	8.0		0.5	9.5	9.5	0.5	9.5	9.5
Effective Green, g (s)	1.7	9.2		0.5	8.0		0.5	9.5	9.5	0.5	9.5	9.5
Actuated g/C Ratio	0.05	0.26		0.01	0.22		0.01	0.27	0.27	0.01	0.27	0.27
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	93	514		27	450		27	1036	464	27	1036	464
v/s Ratio Prot	c0.04	0.02		0.02	c0.03		0.00	0.05		c0.00	c0.10	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.82	0.06		1.19	0.14		0.04	0.19	0.03	0.15	0.39	0.01
Uniform Delay, d1	16.8	10.0		17.6	11.1		17.4	10.1	9.7	17.4	10.7	9.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.4	0.0		234.8	0.1		0.6	0.1	0.0	2.5	0.2	0.0
Delay (s)	57.2	10.0		252.4	11.2		17.9	10.2	9.7	19.9	11.0	9.7
Level of Service	E	B		F	B		B	B	A	B	B	A
Approach Delay (s)		42.4			85.4			10.2			11.0	
Approach LOS		D			F			B			B	

Intersection Summary





















HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	35.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	27.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

102: E Jensen Ave & Golden State Blvd

4/28/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWL	NWT
Lane Configurations												
Volume (vph)	57	43	29	125	59	2	54	74	689	140	91	869
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95			0.97	0.95		0.97	0.95
Frt	1.00	0.94		1.00	1.00			1.00	0.97		1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3776	3660		3776	3875			3776	3795		3776	3788
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	3776	3660		3776	3875			3776	3795		3776	3788
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.78	0.78	0.78	0.78	0.83	0.83
Adj. Flow (vph)	67	51	34	129	61	2	69	95	883	179	110	1047
RTOR Reduction (vph)	0	31	0	0	2	0	0	0	20	0	0	22
Lane Group Flow (vph)	67	54	0	129	61	0	0	164	1042	0	110	1254
Turn Type	Prot			Prot			Prot	Prot			Prot	
Protected Phases	3	8		7	4		5	5	2		1	6
Permitted Phases												
Actuated Green, G (s)	2.1	5.6		2.9	6.4			3.7	30.1		3.7	30.1
Effective Green, g (s)	2.1	5.6		2.9	6.4			3.7	30.1		3.7	30.1
Actuated g/C Ratio	0.04	0.10		0.05	0.11			0.06	0.52		0.06	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	136	352		188	425			240	1959		240	1956
v/s Ratio Prot	0.02	0.01		c0.03	c0.02			c0.04	0.27		0.03	c0.33
v/s Ratio Perm												
v/c Ratio	0.49	0.15		0.69	0.14			0.68	0.53		0.46	0.64
Uniform Delay, d1	27.6	24.2		27.3	23.5			26.7	9.4		26.3	10.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.8	0.2		9.9	0.2			7.8	0.3		1.4	0.7
Delay (s)	30.4	24.4		37.2	23.6			34.5	9.7		27.7	10.9
Level of Service	C	C		D	C			C	A		C	B
Approach Delay (s)		27.0			32.7				13.0			12.3
Approach LOS		C			C				B			B
Intersection Summary												
HCM Average Control Delay			14.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			58.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			54.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 102: E Jensen Ave & Golden State Blvd

4/28/2011



Movement NWR

Lane Configurations

Volume (vph) 190

Ideal Flow (vphpl) 1900

Total Lost time (s)

Lane Util. Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Peak-hour factor, PHF 0.83

Adj. Flow (vph) 229

RTOR Reduction (vph) 0

Lane Group Flow (vph) 0

Turn Type

Protected Phases

Permitted Phases

Actuated Green, G (s)

Effective Green, g (s)

Actuated g/C Ratio

Clearance Time (s)

Vehicle Extension (s)

Lane Grp Cap (vph)

v/s Ratio Prot

v/s Ratio Perm

v/c Ratio

Uniform Delay, d1

Progression Factor

Incremental Delay, d2

Delay (s)

Level of Service

Approach Delay (s)





















Approach LOS

Intersection Summary

HCM Signalized Intersection Capacity Analysis

102: E Jensen Ave & Golden State Blvd

4/28/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWL	NWT
Lane Configurations												
Volume (vph)	135	94	77	124	49	5	123	78	820	92	53	818
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95			0.97	0.95		0.97	0.95
Frt	1.00	0.93		1.00	0.99			1.00	0.98		1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3776	3630		3776	3841			3776	3834		3776	3806
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	3776	3630		3776	3841			3776	3834		3776	3806
Peak-hour factor, PHF	0.85	0.85	0.85	0.97	0.97	0.97	0.85	0.85	0.85	0.85	0.92	0.92
Adj. Flow (vph)	159	111	91	128	51	5	145	92	965	108	58	889
RTOR Reduction (vph)	0	80	0	0	5	0	0	0	11	0	0	21
Lane Group Flow (vph)	159	122	0	128	51	0	0	237	1062	0	58	1023
Turn Type	Prot			Prot			Prot	Prot			Prot	
Protected Phases	3	8		7	4		5	5	2		1	6
Permitted Phases												
Actuated Green, G (s)	4.8	6.2		2.9	4.3			6.3	24.2		2.2	20.1
Effective Green, g (s)	4.8	6.2		2.9	4.3			6.3	24.2		2.2	20.1
Actuated g/C Ratio	0.09	0.12		0.06	0.08			0.12	0.47		0.04	0.39
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	352	437		213	321			462	1802		161	1485
v/s Ratio Prot	c0.04	c0.03		0.03	0.01			c0.06	0.28		0.02	c0.27
v/s Ratio Perm												
v/c Ratio	0.45	0.28		0.60	0.16			0.51	0.59		0.36	0.69
Uniform Delay, d1	22.1	20.6		23.7	21.9			21.2	10.0		24.0	13.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.4		4.7	0.2			1.0	0.5		1.4	1.4
Delay (s)	23.0	21.0		28.4	22.2			22.1	10.5		25.3	14.4
Level of Service	C	C		C	C			C	B		C	B
Approach Delay (s)		21.9			26.5				12.6			15.0
Approach LOS		C			C				B			B

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

102: E Jensen Ave & Golden State Blvd

4/28/2011



Movement NWR

Lane Configurations

Volume (vph) 143

Ideal Flow (vphpl) 1900

Total Lost time (s)

Lane Util. Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Peak-hour factor, PHF 0.92

Adj. Flow (vph) 155

RTOR Reduction (vph) 0

Lane Group Flow (vph) 0

Turn Type

Protected Phases

Permitted Phases

Actuated Green, G (s)

Effective Green, g (s)

Actuated g/C Ratio

Clearance Time (s)

Vehicle Extension (s)

Lane Grp Cap (vph)

v/s Ratio Prot

v/s Ratio Perm

v/c Ratio

Uniform Delay, d1

Progression Factor

Incremental Delay, d2

Delay (s)

Level of Service

Approach Delay (s)



















Approach LOS

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

104: Orange Ave & Golden State Blvd



















4/28/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	49	0	17	0	0	0	0	149	69	13	137	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.66	0.66	0.66	0.90	0.90	0.90	0.98	0.98	0.98
Hourly flow rate (vph)	68	0	24	0	0	0	0	166	77	13	140	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage (veh)								1			1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	300	370	121	249	409	70	140			242		
vC1, stage 1 conf vol	204	204		166	166							
vC2, stage 2 conf vol	96	166		83	242							
vCu, unblocked vol	300	370	121	249	409	70	140			242		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	97	100	100	100	100			99		
cM capacity (veh/h)	659	590	907	684	567	979	1441			1321		
Direction, Lane #	NB 1	SB 1	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3				
Volume Total	92	0	0	110	132	13	93	47				
Volume Left	68	0	0	0	0	13	0	0				
Volume Right	24	0	0	0	77	0	0	0				
cSH	709	1700	1700	1700	1700	1321	1700	1700				
Volume to Capacity	0.13	0.00	0.00	0.06	0.08	0.01	0.05	0.03				
Queue Length 95th (ft)	11	0	0	0	0	1	0	0				
Control Delay (s)	10.8	0.0	0.0	0.0	0.0	7.8	0.0	0.0				
Lane LOS	B	A				A						
Approach Delay (s)	10.8	0.0	0.0			0.7						
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			21.2%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

104: Orange Ave & Golden State Blvd

4/28/2011



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	136	0	32	0	0	0	0	124	49	17	252	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.79	0.79	0.79	0.90	0.90	0.90	0.79	0.79	0.79
Hourly flow rate (vph)	146	0	34	0	0	0	0	138	54	22	319	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage (veh)								1			1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	368	527	96	431	554	159	319			192		
vC1, stage 1 conf vol	165	165		362	362							
vC2, stage 2 conf vol	203	362		69	192							
vCu, unblocked vol	368	527	96	431	554	159	319			192		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	100	96	100	100	100	100			98		
cM capacity (veh/h)	615	508	941	534	496	857	1238			1379		
Direction, Lane #	NB 1	SB 1	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3				
Volume Total	181	0	0	92	100	22	213	106				
Volume Left	146	0	0	0	0	22	0	0				
Volume Right	34	0	0	0	54	0	0	0				
cSH	659	1700	1700	1700	1700	1379	1700	1700				
Volume to Capacity	0.27	0.00	0.00	0.05	0.06	0.02	0.13	0.06				
Queue Length 95th (ft)	28	0	0	0	0	1	0	0				
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	7.7	0.0	0.0				
Lane LOS	B	A				A						
Approach Delay (s)	12.5	0.0	0.0			0.5						
Approach LOS	B	A										
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			29.8%			ICU Level of Service			A			
Analysis Period (min)			15									

HANFORD EXISTING PLUS PROJECT CONDITIONS

HCM Unsignalized Intersection Capacity Analysis

1: SR 198 & 9 th Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	684	26	28	907	9	0	0	39	0	0	63
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.71	0.71	0.71	0.75	0.75	0.75
Hourly flow rate (vph)	55	777	30	32	1031	10	0	0	55	0	0	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1041			807			1564	2006	403	1652	2015	520
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1041			807			1564	2006	403	1652	2015	520
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			96			100	100	91	100	100	83
cM capacity (veh/h)	664			814			57	52	597	54	51	501
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	55	518	289	32	687	354	55	84				
Volume Left	55	0	0	32	0	0	0	0				
Volume Right	0	0	30	0	0	10	55	84				
cSH	664	1700	1700	814	1700	1700	597	501				
Volume to Capacity	0.08	0.30	0.17	0.04	0.40	0.21	0.09	0.17				
Queue Length 95th (ft)	7	0	0	3	0	0	8	15				
Control Delay (s)	10.9	0.0	0.0	9.6	0.0	0.0	11.6	13.6				
Lane LOS	B			A			B	B				
Approach Delay (s)	0.7			0.3			11.6	13.6				
Approach LOS							B	B				
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			35.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: SR 198 & 9 th Ave
















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	988	28	36	704	8	0	0	42	0	0	72
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.83	0.83	0.83	0.73	0.73	0.73	0.69	0.69	0.69
Hourly flow rate (vph)	109	1029	29	43	848	10	0	0	58	0	0	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	858			1058			1878	2207	529	1731	2217	429
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	858			1058			1878	2207	529	1731	2217	429
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			93			100	100	88	100	100	82
cM capacity (veh/h)	779			654			30	35	494	42	35	574
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	109	686	372	43	565	292	58	104				
Volume Left	109	0	0	43	0	0	0	0				
Volume Right	0	0	29	0	0	10	58	104				
cSH	779	1700	1700	654	1700	1700	494	574				
Volume to Capacity	0.14	0.40	0.22	0.07	0.33	0.17	0.12	0.18				
Queue Length 95th (ft)	12	0	0	5	0	0	10	16				
Control Delay (s)	10.4	0.0	0.0	10.9	0.0	0.0	13.2	12.7				
Lane LOS	B			B			B	B				
Approach Delay (s)	1.0			0.5			13.2	12.7				
Approach LOS							B	B				
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			38.2%				ICU Level of Service			A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: SR 198 WB off ramp & SR 198 WB on ramp
















5/24/2011

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (veh/h)	40	0	145	0	276	0	0	390	102	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.68	0.68	0.68	0.75	0.75	0.75	0.86	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	59	0	213	0	368	0	0	453	119	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	881	940	368	572			368			987	881
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	881	940	368	572			368			987	881
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	78	100	69	100			100			100	100
cM capacity (veh/h)	267	264	677	1001			1191			155	286
Direction, Lane #	WB 1	NB 1	SB 1								
Volume Total	272	368	572								
Volume Left	59	0	0								
Volume Right	213	0	119								
cSH	864	1700	1700								
Volume to Capacity	0.31	0.22	0.34								
Queue Length 95th (ft)	34	0	0								
Control Delay (s)	14.8	0.0	0.0								
Lane LOS	B										
Approach Delay (s)	14.8	0.0	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay			3.3								
Intersection Capacity Utilization			30.2%		ICU Level of Service				A		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

2: SR 198 WB off ramp & SR 198 WB on ramp
















5/24/2011

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (veh/h)	21	0	169	0	450	0	0	332	134	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.83	0.83	0.83	0.90	0.90	0.90	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	25	0	204	0	500	0	0	365	147	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	938	1012	500	512			500			1040	938
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	938	1012	500	512			500			1040	938
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	90	100	64	100			100			100	100
cM capacity (veh/h)	244	239	571	1053			1064			134	264
Direction, Lane #	WB 1	NB 1	SB 1								
Volume Total	229	500	512								
Volume Left	25	0	0								
Volume Right	204	0	147								
cSH	642	1700	1700								
Volume to Capacity	0.36	0.29	0.30								
Queue Length 95th (ft)	40	0	0								
Control Delay (s)	15.5	0.0	0.0								
Lane LOS	C										
Approach Delay (s)	15.5	0.0	0.0								
Approach LOS	C										
Intersection Summary											
Average Delay			2.9								
Intersection Capacity Utilization			40.8%		ICU Level of Service				A		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

3: SR 198 EB off ramp & SR 198 EB on ramp
















5/24/2011

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (veh/h)	110	0	91	0	273	35	0	306	0	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.78	0.78	0.78	0.83	0.83	0.83	0.92	0.92
Hourly flow rate (vph)	131	0	108	0	350	45	0	369	0	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	741	764	369	369			395			795	741
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	741	764	369	369			395			795	741
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	61	100	84	100			100			100	100
cM capacity (veh/h)	332	334	677	1190			1164			256	344
Direction, Lane #	EB 1	NB 1	SB 1								
Volume Total	239	395	369								
Volume Left	131	0	0								
Volume Right	108	45	0								
cSH	519	1700	1700								
Volume to Capacity	0.46	0.23	0.22								
Queue Length 95th (ft)	60	0	0								
Control Delay (s)	17.7	0.0	0.0								
Lane LOS	C										
Approach Delay (s)	17.7	0.0	0.0								
Approach LOS	C										
Intersection Summary											
Average Delay			4.2								
Intersection Capacity Utilization			30.2%		ICU Level of Service				A		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

3: SR 198 EB off ramp & SR 198 EB on ramp



















5/24/2011

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (veh/h)	105	0	85	0	439	57	0	184	0	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	117	0	94	0	477	62	0	202	0	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	710	741	202	202			539			758	710
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	710	741	202	202			539			758	710
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	67	100	89	100			100			100	100
cM capacity (veh/h)	348	344	839	1370			1029			287	358
Direction, Lane #	EB 1	NB 1	SB 1								
Volume Total	211	539	202								
Volume Left	117	0	0								
Volume Right	94	62	0								
cSH	551	1700	1700								
Volume to Capacity	0.38	0.32	0.12								
Queue Length 95th (ft)	45	0	0								
Control Delay (s)	15.5	0.0	0.0								
Lane LOS	C										
Approach Delay (s)	15.5	0.0	0.0								
Approach LOS	C										
Intersection Summary											
Average Delay			3.4								
Intersection Capacity Utilization			40.8%		ICU Level of Service				A		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

4: SR 198 & 7th Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	97	569	7	8	828	11	6	12	8	9	10	100
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.86	0.86	0.86	0.45	0.45	0.45
Hourly flow rate (vph)	111	654	8	9	952	13	7	14	9	20	22	222
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	964			662			2084	1864	658	1870	1861	958
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	964			662			2084	1864	658	1870	1861	958
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			99			1	77	98	49	64	29
cM capacity (veh/h)	714			926			7	61	464	39	61	312
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	111	662	9	964	30	264						
Volume Left	111	0	9	0	7	20						
Volume Right	0	8	0	13	9	222						
cSH	714	1700	926	1700	24	167						
Volume to Capacity	0.16	0.39	0.01	0.57	1.24	1.59						
Queue Length 95th (ft)	14	0	1	0	94	445						
Control Delay (s)	11.0	0.0	8.9	0.0	496.3	340.1						
Lane LOS	B		A		F	F						
Approach Delay (s)	1.6		0.1		496.3	340.1						
Approach LOS					F	F						
Intersection Summary												
Average Delay			52.0									
Intersection Capacity Utilization			67.4%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SR 198 & 7th Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	36	989	13	5	786	1	7	3	2	4	3	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.46	0.46	0.46	0.65	0.65	0.65
Hourly flow rate (vph)	39	1075	14	6	925	1	15	7	4	6	5	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	926			1089			2131	2098	1082	2098	2104	925
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	926			1089			2131	2098	1082	2098	2104	925
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			47	87	98	81	90	90
cM capacity (veh/h)	738			641			29	49	264	32	48	326
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	39	1089	6	926	26	43						
Volume Left	39	0	6	0	15	6						
Volume Right	0	14	0	1	4	32						
cSH	738	1700	641	1700	38	111						
Volume to Capacity	0.05	0.64	0.01	0.54	0.68	0.39						
Queue Length 95th (ft)	4	0	1	0	61	40						
Control Delay (s)	10.1	0.0	10.7	0.0	211.9	56.5						
Lane LOS	B		B		F	F						
Approach Delay (s)	0.4		0.1		211.9	56.5						
Approach LOS					F	F						
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			62.8%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: SR 198 & 6th St




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	556	4	4	791	4	6	5	6	4	8	62
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.44	0.44	0.44	0.71	0.71	0.71
Hourly flow rate (vph)	35	654	5	4	869	4	14	11	14	6	11	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	874			659			1698	1609	656	1624	1610	871
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874			659			1698	1609	656	1624	1610	871
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			72	89	97	92	89	75
cM capacity (veh/h)	772			929			48	99	465	70	99	350
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	35	659	4	874	39	104						
Volume Left	35	0	4	0	14	6						
Volume Right	0	5	0	4	14	87						
cSH	772	1700	929	1700	90	235						
Volume to Capacity	0.05	0.39	0.00	0.51	0.43	0.44						
Queue Length 95th (ft)	4	0	0	0	44	53						
Control Delay (s)	9.9	0.0	8.9	0.0	71.6	32.0						
Lane LOS	A		A		F	D						
Approach Delay (s)	0.5		0.0		71.6	32.0						
Approach LOS					F	D						
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			53.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: SR 198 & 6th St

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	102	933	9	3	703	10	0	10	4	2	3	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.79	0.79	0.79	0.88	0.88	0.88	0.69	0.69	0.69
Hourly flow rate (vph)	105	962	9	4	890	13	0	11	5	3	4	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type 		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	903			971			2150	2087	966	2086	2085	896
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	903			971			2150	2087	966	2086	2085	896
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			99			100	75	99	89	90	78
cM capacity (veh/h)	753			710			22	45	309	27	45	339
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	105	971	4	903	16	81						
Volume Left	105	0	4	0	0	3						
Volume Right	0	9	0	13	5	74						
cSH	753	1700	710	1700	60	193						
Volume to Capacity	0.14	0.57	0.01	0.53	0.27	0.42						
Queue Length 95th (ft)	12	0	0	0	23	48						
Control Delay (s)	10.6	0.0	10.1	0.0	85.8	36.4						
Lane LOS	B		B		F	E						
Approach Delay (s)	1.0		0.0		85.8	36.4						
Approach LOS					F	E						
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			68.1%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SR 198 & 2nd Ave.

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	539	6	5	780	4	6	3	3	2	7	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.50	0.50	0.50	0.65	0.65	0.65
Hourly flow rate (vph)	5	612	7	5	857	4	12	6	6	3	11	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	862			619			1528	1498	616	1504	1499	859
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	862			619			1528	1498	616	1504	1499	859
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			85	95	99	97	91	92
cM capacity (veh/h)	780			961			82	121	491	94	121	356
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	624	867	24	42								
Volume Left	5	5	12	3								
Volume Right	7	4	6	28								
cSH	780	961	115	208								
Volume to Capacity	0.01	0.01	0.21	0.20								
Queue Length 95th (ft)	0	0	19	18								
Control Delay (s)	0.2	0.2	44.4	26.6								
Lane LOS	A	A	E	D								
Approach Delay (s)	0.2	0.2	44.4	26.6								
Approach LOS			E	D								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			54.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SR 198 & 2nd Ave.



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	888	10	2	690	8	3	7	2	3	6	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.79	0.79	0.79	0.63	0.63	0.63	0.57	0.57	0.57
Hourly flow rate (vph)	22	935	11	3	873	10	5	11	3	5	11	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	884			945			1901	1873	940	1876	1873	878
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	884			945			1901	1873	940	1876	1873	878
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			89	84	99	89	85	92
cM capacity (veh/h)	766			726			42	70	320	46	70	347
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	967	886	19	44								
Volume Left	22	3	5	5								
Volume Right	11	10	3	28								
cSH	766	726	67	127								
Volume to Capacity	0.03	0.00	0.28	0.35								
Queue Length 95th (ft)	2	0	25	35								
Control Delay (s)	0.9	0.1	78.8	47.7								
Lane LOS	A	A	F	E								
Approach Delay (s)	0.9	0.1	78.8	47.7								
Approach LOS			F	E								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			72.9%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Lacey Blvd. & 8th Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	24	66	107	18	20	65	231	189	18	471	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.89	0.89	0.89	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	17	30	81	120	20	22	75	266	217	21	541	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1038	1223	549	1121	1122	374	557			483		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1038	1223	549	1121	1122	374	557			483		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	82	85	4	89	97	93			98		
cM capacity (veh/h)	172	163	535	125	187	672	1013			1080		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	128	163	75	483	21	557						
Volume Left	17	120	75	0	21	0						
Volume Right	81	22	0	217	0	16						
cSH	296	147	1013	1700	1080	1700						
Volume to Capacity	0.43	1.11	0.07	0.28	0.02	0.33						
Queue Length 95th (ft)	52	221	6	0	1	0						
Control Delay (s)	26.2	166.1	8.8	0.0	8.4	0.0						
Lane LOS	D	F	A		A							
Approach Delay (s)	26.2	166.1	1.2		0.3							
Approach LOS	D	F										
Intersection Summary												
Average Delay			21.9									
Intersection Capacity Utilization			54.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Lacey Blvd. & 8th Ave





















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	18	71	175	27	39	96	469	112	13	235	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.76	0.76	0.76	0.94	0.94	0.94	0.82	0.82	0.82
Hourly flow rate (vph)	32	22	87	230	36	51	102	499	119	16	287	46
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1114	1164	310	1092	1127	559	333			618		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1114	1164	310	1092	1127	559	333			618		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	87	88	0	81	90	92			98		
cM capacity (veh/h)	132	175	730	142	184	529	1226			962		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	140	317	102	618	16	333						
Volume Left	32	230	102	0	16	0						
Volume Right	87	51	0	119	0	46						
cSH	290	166	1226	1700	962	1700						
Volume to Capacity	0.48	1.91	0.08	0.36	0.02	0.20						
Queue Length 95th (ft)	62	598	7	0	1	0						
Control Delay (s)	28.5	479.6	8.2	0.0	8.8	0.0						
Lane LOS	D	F	A		A							
Approach Delay (s)	28.5	479.6	1.2		0.4							
Approach LOS	D	F										
Intersection Summary												
Average Delay			102.9									
Intersection Capacity Utilization			65.0%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

9: Grangeville Blvd. & 8th Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	153	58	77	69	34	39	178	43	118	316	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1786		1770	1771		1770	1808		1770	1859	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1786		1770	1771		1770	1808		1770	1859	
Peak-hour factor, PHF	0.68	0.68	0.68	0.77	0.77	0.77	0.90	0.90	0.90	0.75	0.75	0.75
Adj. Flow (vph)	7	225	85	100	90	44	43	198	48	157	421	5
RTOR Reduction (vph)	0	16	0	0	18	0	0	10	0	0	1	0
Lane Group Flow (vph)	7	294	0	100	116	0	43	236	0	157	425	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.1	17.0		7.3	23.2		4.2	17.0		8.8	21.6	
Effective Green, g (s)	1.1	17.0		7.3	23.2		4.2	17.0		8.8	21.6	
Actuated g/C Ratio	0.02	0.26		0.11	0.35		0.06	0.26		0.13	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	29	459		195	622		112	465		236	607	
v/s Ratio Prot	0.00	c0.16		c0.06	0.07		0.02	0.13		c0.09	c0.23	
v/s Ratio Perm												
v/c Ratio	0.24	0.64		0.51	0.19		0.38	0.51		0.67	0.70	
Uniform Delay, d1	32.1	21.8		27.7	14.9		29.7	21.0		27.2	19.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	3.1		2.3	0.1		2.2	0.9		6.9	3.7	
Delay (s)	36.4	24.9		30.0	15.0		31.9	21.8		34.1	23.1	
Level of Service	D	C		C	B		C	C		C	C	
Approach Delay (s)		25.1			21.4			23.3			26.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.5			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			66.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			49.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: 8th Ave &

5/24/2011















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	73	37	67	86	46	109	377	52	43	183	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.95		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1769		1770	1765		1770	1829		1770	1857	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1769		1770	1765		1770	1829		1770	1857	
Peak-hour factor, PHF	0.71	0.71	0.71	0.85	0.85	0.85	0.90	0.90	0.90	0.93	0.93	0.93
Adj. Flow (vph)	6	103	52	79	101	54	121	419	58	46	197	4
RTOR Reduction (vph)	0	23	0	0	23	0	0	5	0	0	1	0
Lane Group Flow (vph)	6	132	0	79	132	0	121	472	0	46	200	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	0.9	9.0		4.5	12.6		7.4	23.3		2.6	18.5	
Effective Green, g (s)	0.9	9.0		4.5	12.6		7.4	23.3		2.6	18.5	
Actuated g/C Ratio	0.02	0.16		0.08	0.23		0.13	0.42		0.05	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	29	287		144	401		236	769		83	620	
v/s Ratio Prot	0.00	c0.07		c0.04	c0.07		c0.07	c0.26		0.03	0.11	
v/s Ratio Perm												
v/c Ratio	0.21	0.46		0.55	0.33		0.51	0.61		0.55	0.32	
Uniform Delay, d1	26.9	21.0		24.5	17.9		22.3	12.5		25.8	13.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	1.2		4.2	0.5		1.9	1.5		7.8	0.3	
Delay (s)	30.4	22.2		28.7	18.4		24.2	14.0		33.6	14.1	
Level of Service	C	C		C	B		C	B		C	B	
Approach Delay (s)		22.5			21.8			16.1			17.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			18.3			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			55.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			46.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

**BAKERSFIELD EXISTING PLUS PROJECT
CONDITIONS**

HCM Signalized Intersection Capacity Analysis

1: SR-58 EB Off Ramp & S Union Ave















5/24/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				  	  	
Volume (vph)	1255	348	0	2208	1340	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.9	4.9	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	4921	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	4921	
Peak-hour factor, PHF	0.83	0.83	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1512	419	0	2598	1576	433
RTOR Reduction (vph)	0	23	0	0	66	0
Lane Group Flow (vph)	1512	396	0	2598	1943	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.8	20.8		45.1	45.1	
Effective Green, g (s)	20.8	20.8		45.1	45.1	
Actuated g/C Ratio	0.28	0.28		0.60	0.60	
Clearance Time (s)	4.2	4.2		4.9	4.9	
Vehicle Extension (s)	3.0	3.0		4.0	4.0	
Lane Grp Cap (vph)	491	439		3058	2959	
v/s Ratio Prot	0.85			0.51	0.39	
v/s Ratio Perm		0.25				
v/c Ratio	3.08	0.90		0.85	0.66	
Uniform Delay, d1	27.1	26.1		12.2	9.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	941.1	21.3		2.5	0.6	
Delay (s)	968.2	47.4		14.7	10.4	
Level of Service	F	D		B	B	
Approach Delay (s)	768.4			14.7	10.4	
Approach LOS	F			B	B	
Intersection Summary						
HCM Average Control Delay		236.0		HCM Level of Service		F
HCM Volume to Capacity ratio		1.55				
Actuated Cycle Length (s)		75.0		Sum of lost time (s)		9.1
Intersection Capacity Utilization		119.8%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis



















1: SR-58 EB Off Ramp & S Union Ave

5/24/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				  	  	
Volume (vph)	371	159	0	1110	1133	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.9	4.9	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	4962	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	4962	
Peak-hour factor, PHF	0.81	0.81	0.83	0.83	0.75	0.75
Adj. Flow (vph)	458	196	0	1337	1511	291
RTOR Reduction (vph)	0	27	0	0	39	0
Lane Group Flow (vph)	458	169	0	1337	1763	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.3	20.3		43.1	43.1	
Effective Green, g (s)	20.3	20.3		43.1	43.1	
Actuated g/C Ratio	0.28	0.28		0.59	0.59	
Clearance Time (s)	4.2	4.2		4.9	4.9	
Vehicle Extension (s)	3.0	3.0		4.0	4.0	
Lane Grp Cap (vph)	496	443		3023	2950	
v/s Ratio Prot	c0.26			0.26	c0.36	
v/s Ratio Perm		0.11				
v/c Ratio	0.92	0.38		0.44	0.60	
Uniform Delay, d1	25.3	21.0		8.1	9.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.9	0.6		0.1	0.4	
Delay (s)	48.3	21.6		8.2	9.6	
Level of Service	D	C		A	A	
Approach Delay (s)	40.3			8.2	9.6	
Approach LOS	D			A	A	
Intersection Summary						
HCM Average Control Delay		14.4		HCM Level of Service		B
HCM Volume to Capacity ratio		0.70				
Actuated Cycle Length (s)		72.5		Sum of lost time (s)		9.1
Intersection Capacity Utilization		54.9%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis 2: SR-58 Off Ramp & MT Vernon Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	547	2	433	0	0	0	0	270	50	135	361	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Lane Util. Factor	0.95	0.95						0.95	1.00	1.00	0.95	
Frt	1.00	0.87						1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1526						3539	1583	1770	3539	
Flt Permitted	0.95	0.99						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1526						3539	1583	1770	3539	
Peak-hour factor, PHF	0.84	0.84	0.84	0.25	0.25	0.25	0.78	0.78	0.78	0.85	0.85	0.85
Adj. Flow (vph)	651	2	515	0	0	0	0	346	64	159	425	0
RTOR Reduction (vph)	0	255	0	0	0	0	0	0	50	0	0	0
Lane Group Flow (vph)	586	327	0	0	0	0	0	346	14	159	425	0
Turn Type	Split								Perm	Prot		
Protected Phases	8	8						6		5	2	
Permitted Phases									6			
Actuated Green, G (s)	25.7	25.7						14.0	14.0	10.1	27.8	
Effective Green, g (s)	25.7	25.7						14.0	14.0	10.1	27.8	
Actuated g/C Ratio	0.41	0.41						0.22	0.22	0.16	0.44	
Clearance Time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Vehicle Extension (s)	3.8	3.8						4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	681	619						781	350	282	1552	
v/s Ratio Prot	c0.35	0.21						c0.10		c0.09	0.12	
v/s Ratio Perm									0.01			
v/c Ratio	0.86	0.53						0.44	0.04	0.56	0.27	
Uniform Delay, d1	17.2	14.3						21.3	19.4	24.6	11.4	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.1	1.0						0.7	0.1	1.5	0.2	
Delay (s)	28.3	15.3						22.0	19.5	26.2	11.5	
Level of Service	C	B						C	B	C	B	
Approach Delay (s)		21.8			0.0			21.6			15.5	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM Average Control Delay			20.1									
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			63.4									
Intersection Capacity Utilization			55.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: SR-58 Off Ramp & MT Vernon Ave
























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	604	3	72	0	0	0	0	281	68	160	70	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Lane Util. Factor	0.95	0.95						0.95	1.00	1.00	0.95	
Frt	1.00	0.97						1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.96						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1649						3539	1583	1770	3539	
Flt Permitted	0.95	0.96						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1649						3539	1583	1770	3539	
Peak-hour factor, PHF	0.84	0.84	0.84	0.25	0.25	0.25	0.73	0.73	0.73	0.90	0.90	0.90
Adj. Flow (vph)	719	4	86	0	0	0	0	385	93	178	78	0
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	70	0	0	0
Lane Group Flow (vph)	410	389	0	0	0	0	0	385	23	178	78	0
Turn Type	Split								Perm	Prot		
Protected Phases	8	8						6		5	2	
Permitted Phases									6			
Actuated Green, G (s)	22.7	22.7						15.1	15.1	10.9	29.7	
Effective Green, g (s)	22.7	22.7						15.1	15.1	10.9	29.7	
Actuated g/C Ratio	0.36	0.36						0.24	0.24	0.17	0.48	
Clearance Time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Vehicle Extension (s)	3.8	3.8						4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	612	601						858	384	310	1687	
v/s Ratio Prot	c0.24	0.24						c0.11		c0.10	0.02	
v/s Ratio Perm									0.01			
v/c Ratio	0.67	0.65						0.45	0.06	0.57	0.05	
Uniform Delay, d1	16.6	16.5						20.1	18.1	23.6	8.7	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.0	2.6						0.6	0.1	1.6	0.0	
Delay (s)	19.7	19.1						20.7	18.2	25.2	8.7	
Level of Service	B	B						C	B	C	A	
Approach Delay (s)		19.4			0.0			20.2			20.2	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM Average Control Delay			19.8									HCM Level of Service B
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			62.3							13.6		
Intersection Capacity Utilization			47.8%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: E Brundage Lane & Oak St
























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	99	232	169	105	185	65	124	412	173	36	213	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3402		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3402		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.84	0.84	0.84	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	109	255	186	125	220	77	153	509	214	44	263	135
RTOR Reduction (vph)	0	0	154	0	26	0	0	0	148	0	0	113
Lane Group Flow (vph)	109	255	32	125	271	0	153	509	66	44	263	22
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			8
Actuated Green, G (s)	7.1	10.3	10.3	9.8	13.0		12.0	18.4	18.4	3.4	9.8	9.8
Effective Green, g (s)	7.1	10.3	10.3	9.8	13.0		12.0	18.4	18.4	3.4	9.8	9.8
Actuated g/C Ratio	0.12	0.17	0.17	0.16	0.22		0.20	0.31	0.31	0.06	0.16	0.16
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	210	609	272	290	738		355	1087	486	100	579	259
v/s Ratio Prot	c0.06	0.07		c0.07	c0.08		c0.09	c0.14		0.02	0.07	
v/s Ratio Perm			0.02						0.04			0.01
v/c Ratio	0.52	0.42	0.12	0.43	0.37		0.43	0.47	0.14	0.44	0.45	0.09
Uniform Delay, d1	24.8	22.1	21.0	22.5	20.0		21.0	16.8	15.0	27.3	22.6	21.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2	0.1	0.4	0.1		0.3	0.1	0.0	1.1	0.2	0.1
Delay (s)	25.7	22.3	21.0	22.9	20.1		21.3	16.9	15.0	28.5	22.8	21.3
Level of Service	C	C	C	C	C		C	B	B	C	C	C
Approach Delay (s)		22.5			20.9			17.2			22.9	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			20.3			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			59.9			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			42.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: E Brundage Lane & Oak St

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	307	316	216	281	102	149	400	181	89	618	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3398		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3398		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.86	0.86	0.86	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	167	349	359	251	327	119	164	440	199	101	702	148
RTOR Reduction (vph)	0	0	297	0	27	0	0	0	150	0	0	92
Lane Group Flow (vph)	167	349	62	251	419	0	164	440	49	101	702	56
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			8
Actuated Green, G (s)	13.9	16.0	16.0	18.7	20.8		14.5	23.0	23.0	17.4	25.9	25.9
Effective Green, g (s)	13.9	16.0	16.0	18.7	20.8		14.5	23.0	23.0	17.4	25.9	25.9
Actuated g/C Ratio	0.15	0.17	0.17	0.20	0.22		0.16	0.25	0.25	0.19	0.28	0.28
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	264	608	272	356	759		276	874	391	331	985	440
v/s Ratio Prot	0.09	c0.10		c0.14	c0.12		c0.09	0.12		c0.06	c0.20	
v/s Ratio Perm			0.04						0.03			0.04
v/c Ratio	0.63	0.57	0.23	0.71	0.55		0.59	0.50	0.13	0.31	0.71	0.13
Uniform Delay, d1	37.2	35.4	33.2	34.6	32.0		36.6	30.1	27.2	32.6	30.3	25.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	0.8	0.2	5.1	0.5		2.3	0.2	0.1	0.2	2.1	0.0
Delay (s)	40.8	36.2	33.4	39.8	32.5		38.8	30.3	27.3	32.8	32.3	25.2
Level of Service	D	D	C	D	C		D	C	C	C	C	C
Approach Delay (s)		35.9			35.1			31.3			31.3	
Approach LOS		D			D			C			C	























Intersection Summary

HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	93.1	Sum of lost time (s)	27.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: E Brundage Lane & Chester Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	312	91	52	247	26	84	526	78	28	214	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3489		1770	3470		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3489		1770	3470		1770	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.76	0.76	0.76	0.80	0.80	0.80	0.93	0.93	0.93
Adj. Flow (vph)	173	355	103	68	325	34	105	658	98	30	230	78
RTOR Reduction (vph)	0	0	46	0	6	0	0	7	0	0	0	57
Lane Group Flow (vph)	173	355	57	68	353	0	105	749	0	30	230	21
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	11.9	20.4	20.4	5.9	14.4		7.2	22.4		3.2	18.4	18.4
Effective Green, g (s)	11.9	20.4	20.4	5.9	14.4		7.2	22.4		3.2	18.4	18.4
Actuated g/C Ratio	0.18	0.30	0.30	0.09	0.21		0.11	0.33		0.05	0.27	0.27
Clearance Time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	311	1066	477	154	742		188	1148		84	962	430
v/s Ratio Prot	c0.10	0.10		0.04	c0.10		c0.06	c0.22		0.02	0.06	
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.56	0.33	0.12	0.44	0.48		0.56	0.65		0.36	0.24	0.05
Uniform Delay, d1	25.5	18.4	17.1	29.3	23.3		28.7	19.3		31.3	19.2	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	0.0	0.7	0.2		2.0	1.0		0.9	0.0	0.0
Delay (s)	26.7	18.4	17.2	30.1	23.5		30.8	20.3		32.2	19.2	18.2
Level of Service	C	B	B	C	C		C	C		C	B	B
Approach Delay (s)		20.5			24.6			21.6			20.2	
Approach LOS		C			C			C			C	























Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	11.4
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: E Brundage Lane & Chester Ave






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	292	87	90	381	52	79	368	57	68	621	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3475		1770	3468		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3475		1770	3468		1770	3539	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	159	344	102	97	410	56	93	433	67	76	698	193
RTOR Reduction (vph)	0	0	47	0	7	0	0	8	0	0	0	133
Lane Group Flow (vph)	159	344	55	97	459	0	93	492	0	76	698	60
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	23.3	23.3	7.3	18.4		7.1	24.8		6.3	24.0	24.0
Effective Green, g (s)	12.2	23.3	23.3	7.3	18.4		7.1	24.8		6.3	24.0	24.0
Actuated g/C Ratio	0.16	0.30	0.30	0.09	0.24		0.09	0.32		0.08	0.31	0.31
Clearance Time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	279	1064	476	167	825		162	1110		144	1096	490
v/s Ratio Prot	c0.09	0.10		0.05	c0.13		c0.05	0.14		0.04	c0.20	
v/s Ratio Perm			0.03									0.04
v/c Ratio	0.57	0.32	0.12	0.58	0.56		0.57	0.44		0.53	0.64	0.12
Uniform Delay, d1	30.2	21.0	19.6	33.6	26.0		33.8	20.9		34.2	23.0	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	0.1	0.0	3.3	0.5		3.0	0.1		1.6	0.9	0.0
Delay (s)	31.8	21.1	19.7	36.9	26.4		36.8	21.0		35.8	23.9	19.2
Level of Service	C	C	B	D	C		D	C		D	C	B
Approach Delay (s)		23.7			28.2			23.5			23.9	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.6			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			77.5			Sum of lost time (s)			15.8			
Intersection Capacity Utilization			55.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: E Brundage Lane & P Street






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	220	30	44	234	39	39	128	56	33	72	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3475		1770	3464		1770	1863	1583	1770	1764	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	1770	3475		1770	3464		1258	1863	1583	1187	1764	
Peak-hour factor, PHF	0.80	0.80	0.80	0.86	0.86	0.86	0.67	0.67	0.67	0.88	0.88	0.88
Adj. Flow (vph)	78	275	38	51	272	45	58	191	84	38	82	45
RTOR Reduction (vph)	0	10	0	0	13	0	0	0	64	0	18	0
Lane Group Flow (vph)	78	303	0	51	304	0	58	191	20	38	109	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8		8	4		
Actuated Green, G (s)	3.2	10.5		1.9	9.2		8.2	8.2	8.2	8.2	8.2	
Effective Green, g (s)	3.2	10.5		1.9	9.2		8.2	8.2	8.2	8.2	8.2	
Actuated g/C Ratio	0.09	0.30		0.05	0.27		0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	164	1055		97	921		298	442	375	281	418	
v/s Ratio Prot	c0.04	0.09		0.03	c0.09			c0.10			0.06	
v/s Ratio Perm							0.05		0.01	0.03		
v/c Ratio	0.48	0.29		0.53	0.33		0.19	0.43	0.05	0.14	0.26	
Uniform Delay, d1	14.9	9.2		15.9	10.2		10.6	11.2	10.2	10.4	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.1		2.4	0.1		0.1	0.2	0.0	0.1	0.1	
Delay (s)	15.7	9.3		18.3	10.3		10.7	11.5	10.2	10.5	10.9	
Level of Service	B	A		B	B		B	B	B	B	B	
Approach Delay (s)		10.5			11.4			11.0			10.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			10.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			34.6			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			38.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: E Brundage Lane & P Street

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	348	50	77	408	43	27	112	71	35	171	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3473		1770	3488		1770	1863	1583	1770	1812	
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00	1.00	0.67	1.00	
Satd. Flow (perm)	1770	3473		1770	3488		975	1863	1583	1247	1812	
Peak-hour factor, PHF	0.89	0.89	0.89	0.77	0.77	0.77	0.82	0.82	0.82	0.73	0.73	0.73
Adj. Flow (vph)	30	391	56	100	530	56	33	137	87	48	234	52
RTOR Reduction (vph)	0	10	0	0	7	0	0	0	64	0	7	0
Lane Group Flow (vph)	30	437	0	100	579	0	33	137	23	48	279	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.8	13.4		5.4	17.0		11.5	11.5	11.5	11.5	11.5	
Effective Green, g (s)	1.8	13.4		5.4	17.0		11.5	11.5	11.5	11.5	11.5	
Actuated g/C Ratio	0.04	0.30		0.12	0.38		0.26	0.26	0.26	0.26	0.26	
Clearance Time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	72	1051		216	1339		253	484	411	324	470	
v/s Ratio Prot	0.02	0.13		c0.06	c0.17			0.07			c0.15	
v/s Ratio Perm							0.03		0.01	0.04		
v/c Ratio	0.42	0.42		0.46	0.43		0.13	0.28	0.05	0.15	0.59	
Uniform Delay, d1	20.7	12.3		18.1	10.1		12.6	13.1	12.3	12.6	14.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	0.1		0.6	0.1		0.1	0.1	0.0	0.1	1.3	
Delay (s)	22.2	12.4		18.7	10.2		12.7	13.2	12.3	12.7	15.7	
Level of Service	C	B		B	B		B	B	B	B	B	
Approach Delay (s)		13.0			11.4			12.9			15.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			12.8			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			44.3			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			48.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: E Brundage Lane & S Union ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	109	65	256	223	318	98	1297	193	95	825	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4987		1770	5034	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4987		1770	5034	
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.81	0.81	0.81	0.88	0.88	0.88
Adj. Flow (vph)	127	127	76	288	251	357	121	1601	238	108	938	67
RTOR Reduction (vph)	0	0	67	0	0	280	0	12	0	0	5	0
Lane Group Flow (vph)	127	127	9	288	251	77	121	1827	0	108	1000	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.5	11.7	11.7	20.5	20.7	20.7	11.2	36.0		10.5	35.3	
Effective Green, g (s)	11.5	11.7	11.7	20.5	20.7	20.7	11.2	36.0		10.5	35.3	
Actuated g/C Ratio	0.12	0.12	0.12	0.21	0.22	0.22	0.12	0.38		0.11	0.37	
Clearance Time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Vehicle Extension (s)	2.0	5.4	5.4	2.0	5.3	5.3	2.0	4.5		2.0	5.2	
Lane Grp Cap (vph)	212	432	193	378	764	342	207	1872		194	1853	
v/s Ratio Prot	0.07	0.04		c0.16	c0.07		c0.07	c0.37		0.06	0.20	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.60	0.29	0.05	0.76	0.33	0.23	0.58	0.98		0.56	0.54	
Uniform Delay, d1	40.0	38.3	37.2	35.4	31.7	31.0	40.1	29.5		40.5	23.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.9	0.2	7.9	0.6	0.8	2.7	15.4		2.0	0.6	
Delay (s)	43.0	39.2	37.4	43.4	32.3	31.8	42.8	45.0		42.5	24.5	
Level of Service	D	D	D	D	C	C	D	D		D	C	
Approach Delay (s)		40.3			35.6			44.8			26.2	
Approach LOS		D			D			D			C	
























Intersection Summary

HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	95.9	Sum of lost time (s)	7.4
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6: E Brundage Lane & S Union ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	195	136	239	282	242	111	905	267	103	1255	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4911		1770	5043	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4911		1770	5043	
Peak-hour factor, PHF	0.88	0.88	0.88	0.87	0.87	0.87	0.83	0.83	0.83	0.76	0.76	0.76
Adj. Flow (vph)	131	222	155	275	324	278	134	1090	322	136	1651	96
RTOR Reduction (vph)	0	0	132	0	0	214	0	34	0	0	4	0
Lane Group Flow (vph)	131	222	23	275	324	64	134	1378	0	136	1743	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.1	15.2	15.2	20.2	23.3	23.3	12.3	35.7		12.4	35.8	
Effective Green, g (s)	12.1	15.2	15.2	20.2	23.3	23.3	12.3	35.7		12.4	35.8	
Actuated g/C Ratio	0.12	0.15	0.15	0.20	0.23	0.23	0.12	0.35		0.12	0.36	
Clearance Time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Vehicle Extension (s)	2.0	5.4	5.4	2.0	5.3	5.3	2.0	4.5		2.0	5.2	
Lane Grp Cap (vph)	213	534	239	355	819	366	216	1741		218	1793	
v/s Ratio Prot	0.07	0.06		c0.16	c0.09		0.08	0.28		c0.08	c0.35	
v/s Ratio Perm			0.01			0.04						
v/c Ratio	0.62	0.42	0.10	0.77	0.40	0.18	0.62	0.79		0.62	0.97	
Uniform Delay, d1	42.1	38.7	36.8	38.1	32.7	31.0	42.0	29.2		41.9	32.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	1.3	0.4	9.3	0.7	0.5	3.9	2.8		4.0	15.3	
Delay (s)	45.8	40.0	37.3	47.4	33.5	31.5	45.9	32.0		45.9	47.3	
Level of Service	D	D	D	D	C	C	D	C		D	D	
Approach Delay (s)		40.6			37.2			33.2			47.2	
Approach LOS		D			D			C			D	





















Intersection Summary

HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	7.4
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

7: E Brundage Lane & Liggett Street

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	342	31	64	277	4	482	22	12	2	40	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.95			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3531		1770	1763			1750	
Flt Permitted	0.55	1.00	1.00	0.51	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	1020	3539	1583	955	3531		1770	1763			1750	
Peak-hour factor, PHF	0.91	0.91	0.91	0.83	0.83	0.83	0.77	0.77	0.77	0.78	0.78	0.78
Adj. Flow (vph)	21	376	34	77	334	5	626	29	16	3	51	42
RTOR Reduction (vph)	0	0	26	0	2	0	0	8	0	0	36	0
Lane Group Flow (vph)	21	376	8	77	337	0	626	37	0	0	60	0
Turn Type	Perm		Perm	Perm			Split			Split		
Protected Phases		2			6		8	8		7	7	
Permitted Phases	2		2	6								
Actuated Green, G (s)	14.8	14.8	14.8	14.8	14.8		31.2	31.2			5.9	
Effective Green, g (s)	14.8	14.8	14.8	14.8	14.8		31.2	31.2			5.9	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.47	0.47			0.09	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			2.0	
Lane Grp Cap (vph)	228	791	354	214	789		834	831			156	
v/s Ratio Prot		c0.11			0.10		c0.35	0.02			c0.03	
v/s Ratio Perm	0.02		0.00	0.08								
v/c Ratio	0.09	0.48	0.02	0.36	0.43		0.75	0.04			0.38	
Uniform Delay, d1	20.4	22.3	20.1	21.7	22.1		14.3	9.4			28.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.6	0.0	1.4	0.5		4.1	0.0			0.6	
Delay (s)	20.6	22.9	20.1	23.1	22.6		18.4	9.5			29.0	
Level of Service	C	C	C	C	C		B	A			C	
Approach Delay (s)		22.6			22.7			17.8			29.0	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			21.0			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			66.2			Sum of lost time (s)			14.3			
Intersection Capacity Utilization			66.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: E Brundage Lane & Liggett Street






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Volume (vph)	59	462	41	78	403	4	298	29	21	3	54	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3534		1770	1746			1734	
Flt Permitted	0.40	1.00	1.00	0.40	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	743	3539	1583	747	3534		1770	1746			1734	
Peak-hour factor, PHF	0.88	0.88	0.88	0.77	0.77	0.77	0.81	0.81	0.81	0.58	0.58	0.58
Adj. Flow (vph)	67	525	47	101	523	5	368	36	26	5	93	100
RTOR Reduction (vph)	0	0	33	0	1	0	0	18	0	0	44	0
Lane Group Flow (vph)	67	525	14	101	527	0	368	44	0	0	154	0
Turn Type	Perm		Perm	Perm			Split			Split		
Protected Phases		2			6		8	8		7	7	
Permitted Phases	2		2	6								
Actuated Green, G (s)	18.4	18.4	18.4	18.4	18.4		20.1	20.1			10.6	
Effective Green, g (s)	18.4	18.4	18.4	18.4	18.4		20.1	20.1			10.6	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29		0.32	0.32			0.17	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			2.0	
Lane Grp Cap (vph)	216	1027	459	217	1026		561	554			290	
v/s Ratio Prot		0.15			c0.15		c0.21	0.03			c0.09	
v/s Ratio Perm	0.09		0.01	0.14								
v/c Ratio	0.31	0.51	0.03	0.47	0.51		0.66	0.08			0.53	
Uniform Delay, d1	17.5	18.8	16.1	18.5	18.8		18.7	15.2			24.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.1	0.6	0.0	2.1	0.6		3.1	0.1			0.9	
Delay (s)	18.7	19.3	16.1	20.6	19.4		21.7	15.3			25.1	
Level of Service	B	B	B	C	B		C	B			C	
Approach Delay (s)		19.0			19.6			20.8			25.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			20.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			63.4			Sum of lost time (s)			14.3			
Intersection Capacity Utilization			59.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: E Brundage Lane & MT Vernon Ave






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	95	69	195	138	46	60	577	147	46	594	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.96		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1745		1770	1793		1770	3431		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1745		1770	1793		1770	3431		1770	3539	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.98	0.98	0.98	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	79	104	76	199	141	47	72	695	177	55	716	106
RTOR Reduction (vph)	0	29	0	0	12	0	0	21	0	0	0	72
Lane Group Flow (vph)	79	151	0	199	176	0	72	851	0	55	716	34
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	5.7	12.2		11.7	18.2		5.5	24.2		3.8	22.5	22.5
Effective Green, g (s)	5.7	12.2		11.7	18.2		5.5	24.2		3.8	22.5	22.5
Actuated g/C Ratio	0.08	0.17		0.17	0.26		0.08	0.34		0.05	0.32	0.32
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	1.0	2.0		1.5	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	143	302		294	463		138	1178		95	1129	505
v/s Ratio Prot	0.04	0.09		0.11	0.10		0.04	0.25		0.03	0.20	
v/s Ratio Perm												0.02
v/c Ratio	0.55	0.50		0.68	0.38		0.52	0.72		0.58	0.63	0.07
Uniform Delay, d1	31.2	26.4		27.6	21.5		31.2	20.2		32.6	20.5	16.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	0.5		4.8	0.2		1.6	1.9		5.2	0.9	0.0
Delay (s)	33.8	26.9		32.4	21.7		32.9	22.1		37.8	21.4	16.7
Level of Service	C	C		C	C		C	C		D	C	B
Approach Delay (s)		29.0			27.2			22.9			21.8	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			23.8			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			70.5			Sum of lost time (s)				13.3		
Intersection Capacity Utilization			59.5%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: E Brundage Lane & MT Vernon Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	208	70	106	175	39	77	648	127	57	604	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1793		1770	1812		1770	3452		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1793		1770	1812		1770	3452		1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	147	221	74	123	203	45	88	736	144	65	686	198
RTOR Reduction (vph)	0	12	0	0	9	0	0	15	0	0	0	134
Lane Group Flow (vph)	147	283	0	123	239	0	88	865	0	65	686	64
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.9	17.4		9.2	16.7		6.1	25.0		5.4	24.3	24.3
Effective Green, g (s)	9.9	17.4		9.2	16.7		6.1	25.0		5.4	24.3	24.3
Actuated g/C Ratio	0.13	0.23		0.12	0.22		0.08	0.33		0.07	0.32	0.32
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	1.0	2.0		1.5	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	232	413		215	400		143	1142		126	1138	509
v/s Ratio Prot	c0.08	c0.16		0.07	0.13		c0.05	c0.25		0.04	0.19	
v/s Ratio Perm												0.04
v/c Ratio	0.63	0.68		0.57	0.60		0.62	0.76		0.52	0.60	0.13
Uniform Delay, d1	31.1	26.6		31.3	26.4		33.6	22.6		33.8	21.6	18.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	3.7		2.3	1.6		5.4	2.6		1.5	0.6	0.0
Delay (s)	35.2	30.3		33.6	28.1		39.0	25.2		35.3	22.2	18.2
Level of Service	D	C		C	C		D	C		D	C	B
Approach Delay (s)		32.0			29.9			26.4			22.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			26.4			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			75.6			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			61.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: 4TH Street & Chester Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	110	16	54	84	35	21	610	46	27	248	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1827		1770	1780		1770	3502		1770	3494	
Flt Permitted	0.67	1.00		0.64	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1241	1827		1193	1780		1770	3502		1770	3494	
Peak-hour factor, PHF	0.68	0.68	0.68	0.84	0.84	0.84	0.69	0.69	0.69	0.92	0.92	0.92
Adj. Flow (vph)	81	162	24	64	100	42	30	884	67	29	270	25
RTOR Reduction (vph)	0	5	0	0	14	0	0	4	0	0	5	0
Lane Group Flow (vph)	81	181	0	64	128	0	30	947	0	29	290	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	10.9	10.9		10.9	10.9		1.7	19.6		1.7	19.6	
Effective Green, g (s)	10.9	10.9		10.9	10.9		1.7	19.6		1.7	19.6	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.04	0.43		0.04	0.43	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	295	435		284	424		66	1499		66	1495	
v/s Ratio Prot		c0.10			0.07		c0.02	c0.27		0.02	0.08	
v/s Ratio Perm	0.07			0.05								
v/c Ratio	0.27	0.42		0.23	0.30		0.45	0.63		0.44	0.19	
Uniform Delay, d1	14.2	14.8		14.1	14.3		21.6	10.3		21.6	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.1	0.1		1.8	0.6		1.7	0.0	
Delay (s)	14.4	15.0		14.2	14.5		23.4	10.9		23.3	8.2	
Level of Service	B	B		B	B		C	B		C	A	
Approach Delay (s)		14.8			14.4			11.3			9.5	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			11.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			45.8			Sum of lost time (s)			13.6			
Intersection Capacity Utilization			45.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: 4TH Street & Chester Ave

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	75	29	61	98	34	31	503	24	30	789	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1785		1770	1791		1770	3515		1770	3513	
Flt Permitted	0.65	1.00		0.67	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1204	1785		1244	1791		1770	3515		1770	3513	
Peak-hour factor, PHF	0.74	0.74	0.74	0.75	0.75	0.75	0.88	0.88	0.88	0.80	0.80	0.80
Adj. Flow (vph)	41	101	39	81	131	45	35	572	27	38	986	52
RTOR Reduction (vph)	0	12	0	0	12	0	0	2	0	0	3	0
Lane Group Flow (vph)	41	128	0	81	164	0	35	597	0	38	1035	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	10.7	10.7		10.7	10.7		1.9	20.6		3.0	21.7	
Effective Green, g (s)	10.7	10.7		10.7	10.7		1.9	20.6		3.0	21.7	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.04	0.43		0.06	0.45	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	269	399		278	400		70	1512		111	1591	
v/s Ratio Prot		0.07			c0.09		0.02	0.17		c0.02	c0.29	
v/s Ratio Perm	0.03			0.07								
v/c Ratio	0.15	0.32		0.29	0.41		0.50	0.39		0.34	0.65	
Uniform Delay, d1	15.0	15.6		15.5	15.9		22.5	9.4		21.5	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.2	0.3		2.0	0.1		0.7	0.7	
Delay (s)	15.1	15.7		15.7	16.2		24.6	9.4		22.2	10.9	
Level of Service	B	B		B	B		C	A		C	B	
Approach Delay (s)		15.6			16.0			10.3			11.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			11.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			47.9			Sum of lost time (s)			8.6			
Intersection Capacity Utilization			49.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: 4TH Street & P Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	58	21	32	65	28	17	213	22	25	232	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1836		1770	1838	
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.60	1.00		0.60	1.00	
Satd. Flow (perm)	1863	1863	1583	1863	1863	1583	1112	1836		1122	1838	
Peak-hour factor, PHF	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.85	0.85	0.85
Adj. Flow (vph)	26	66	24	39	79	34	18	229	24	29	273	27
RTOR Reduction (vph)	0	0	20	0	0	29	0	5	0	0	5	0
Lane Group Flow (vph)	26	66	4	39	79	5	18	248	0	29	295	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	2.9	2.9	2.9	2.9	2.9	2.9	6.7	6.7		6.7	6.7	
Effective Green, g (s)	2.9	2.9	2.9	2.9	2.9	2.9	6.7	6.7		6.7	6.7	
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.15	0.35	0.35		0.35	0.35	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	284	284	242	284	284	242	392	647		396	648	
v/s Ratio Prot		0.04			c0.04			0.13			c0.16	
v/s Ratio Perm	0.01		0.00	0.02		0.00	0.02			0.03		
v/c Ratio	0.09	0.23	0.02	0.14	0.28	0.02	0.05	0.38		0.07	0.45	
Uniform Delay, d1	6.9	7.1	6.8	7.0	7.1	6.8	4.0	4.6		4.1	4.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2	0.0	0.1	0.2	0.0	0.0	0.1		0.0	0.2	
Delay (s)	7.0	7.2	6.8	7.0	7.3	6.9	4.1	4.7		4.1	4.9	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		7.1			7.1			4.7			4.9	
Approach LOS		A			A			A			A	

























Intersection Summary

HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	19.0	Sum of lost time (s)	9.4
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

10: 4TH Street & P Street




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	104	18	34	125	20	19	88	40	32	152	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1775		1770	1810	
Flt Permitted	0.80	1.00	1.00	0.80	1.00	1.00	0.66	1.00		0.66	1.00	
Satd. Flow (perm)	1490	1863	1583	1490	1863	1583	1221	1775		1221	1810	
Peak-hour factor, PHF	0.92	0.92	0.92	0.83	0.83	0.83	0.79	0.79	0.79	0.70	0.70	0.70
Adj. Flow (vph)	25	113	20	41	151	24	24	111	51	46	217	51
RTOR Reduction (vph)	0	0	15	0	0	18	0	26	0	0	13	0
Lane Group Flow (vph)	25	113	5	41	151	6	24	136	0	46	255	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.1	6.1		6.1	6.1	
Effective Green, g (s)	5.0	5.0	5.0	5.0	5.0	5.0	6.1	6.1		6.1	6.1	
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.24	0.30	0.30		0.30	0.30	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	363	454	386	363	454	386	363	528		363	539	
v/s Ratio Prot		0.06			c0.08			0.08			c0.14	
v/s Ratio Perm	0.02		0.00	0.03		0.00	0.02			0.04		
v/c Ratio	0.07	0.25	0.01	0.11	0.33	0.02	0.07	0.26		0.13	0.47	
Uniform Delay, d1	6.0	6.2	5.9	6.0	6.4	5.9	5.2	5.5		5.3	5.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.1		0.1	0.2	
Delay (s)	6.0	6.3	5.9	6.1	6.5	5.9	5.2	5.6		5.3	6.1	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		6.2			6.4			5.5			6.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.0			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			20.5			Sum of lost time (s)			9.4			
Intersection Capacity Utilization			39.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: 4TH Street & S Union ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	69	54	33	57	21	66	1656	38	39	1081	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.93			0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1740			1788		1770	5068		1770	5021	
Flt Permitted	0.79	1.00			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1478	1740			1544		1770	5068		1770	5021	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.80	0.80	0.80	0.74	0.74	0.74
Adj. Flow (vph)	62	78	61	34	59	22	82	2070	48	53	1461	134
RTOR Reduction (vph)	0	46	0	0	14	0	0	2	0	0	11	0
Lane Group Flow (vph)	62	93	0	0	101	0	82	2116	0	53	1584	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	6.2	6.2			6.5		4.2	27.2		3.6	26.6	
Effective Green, g (s)	6.2	6.2			6.5		4.2	27.2		3.6	26.6	
Actuated g/C Ratio	0.12	0.12			0.13		0.08	0.54		0.07	0.53	
Clearance Time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Vehicle Extension (s)	0.2	0.2			0.2		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	183	215			200		148	2751		127	2666	
v/s Ratio Prot		0.05					c0.05	c0.42		0.03	0.32	
v/s Ratio Perm	0.04				c0.07							
v/c Ratio	0.34	0.43			0.51		0.55	0.77		0.42	0.59	
Uniform Delay, d1	20.1	20.3			20.3		22.1	9.0		22.2	8.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5			0.7		2.5	1.7		0.8	0.6	
Delay (s)	20.5	20.8			21.0		24.6	10.7		23.1	8.7	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		20.7			21.0			11.2			9.1	
Approach LOS		C			C			B			A	





















Intersection Summary

HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	50.1	Sum of lost time (s)	7.9
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

11: 4TH Street & S Union ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	91	36	61	54	33	74	1164	37	86	1644	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.96			0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1784			1770		1770	5062		1770	5054	
Flt Permitted	0.63	1.00			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1169	1784			1438		1770	5062		1770	5054	
Peak-hour factor, PHF	0.81	0.81	0.81	0.90	0.90	0.90	0.96	0.96	0.96	0.82	0.82	0.82
Adj. Flow (vph)	95	112	44	68	60	37	77	1212	39	105	2005	85
RTOR Reduction (vph)	0	23	0	0	16	0	0	3	0	0	5	0
Lane Group Flow (vph)	95	133	0	0	149	0	77	1248	0	105	2085	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	7.1	7.1			7.4		4.4	27.6		6.2	29.4	
Effective Green, g (s)	7.1	7.1			7.4		4.4	27.6		6.2	29.4	
Actuated g/C Ratio	0.13	0.13			0.14		0.08	0.51		0.11	0.54	
Clearance Time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Vehicle Extension (s)	0.2	0.2			0.2		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	154	235			197		144	2587		203	2752	
v/s Ratio Prot		0.07					0.04	0.25		c0.06	c0.41	
v/s Ratio Perm	0.08				c0.10							
v/c Ratio	0.62	0.57			0.75		0.53	0.48		0.52	0.76	
Uniform Delay, d1	22.2	22.0			22.4		23.8	8.6		22.5	9.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	1.9			13.5		1.9	0.4		0.9	1.6	
Delay (s)	27.2	23.9			35.9		25.7	8.9		23.4	11.1	
Level of Service	C	C			D		C	A		C	B	
Approach Delay (s)		25.2			35.9			9.9			11.7	
Approach LOS		C			D			A			B	
Intersection Summary												
HCM Average Control Delay			13.0				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			54.0				Sum of lost time (s)		7.9			
Intersection Capacity Utilization			68.2%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: 8TH Street & Chester Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	26	5	21	26	28	2	707	28	18	287	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.92		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1818		1770	1719		1770	3519		1770	3525	
Flt Permitted	0.83	1.00		0.83	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1552	1818		1552	1719		1770	3519		1770	3525	
Peak-hour factor, PHF	0.62	0.62	0.62	0.75	0.75	0.75	0.70	0.70	0.70	0.87	0.87	0.87
Adj. Flow (vph)	10	42	8	28	35	37	3	1010	40	21	330	9
RTOR Reduction (vph)	0	7	0	0	32	0	0	2	0	0	2	0
Lane Group Flow (vph)	10	43	0	28	40	0	3	1048	0	21	337	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	4.8	4.8		4.8	4.8		2.4	18.2		0.7	16.5	
Effective Green, g (s)	4.8	4.8		4.8	4.8		2.4	18.2		0.7	16.5	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.06	0.49		0.02	0.44	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	200	234		200	221		114	1717		33	1559	
v/s Ratio Prot		c0.02			0.02		0.00	c0.30		0.01	c0.10	
v/s Ratio Perm	0.01			0.02								
v/c Ratio	0.05	0.18		0.14	0.18		0.03	0.61		0.64	0.22	
Uniform Delay, d1	14.3	14.5		14.4	14.5		16.4	7.0		18.2	6.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1		0.1	0.1		0.0	0.5		25.9	0.0	
Delay (s)	14.3	14.6		14.5	14.6		16.4	7.4		44.1	6.4	
Level of Service	B	B		B	B		B	A		D	A	
Approach Delay (s)		14.6			14.6			7.4			8.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.4			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			37.3			Sum of lost time (s)			14.6			
Intersection Capacity Utilization			36.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: 8TH Street & Chester Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	38	18	59	27	28	15	608	27	20	715	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1772		1770	1721		1770	3517		1770	3532	
Flt Permitted	0.71	1.00		0.71	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1324	1772		1317	1721		1770	3517		1770	3532	
Peak-hour factor, PHF	0.73	0.73	0.73	0.78	0.78	0.78	0.84	0.84	0.84	0.79	0.79	0.79
Adj. Flow (vph)	15	52	25	76	35	36	18	724	32	25	905	13
RTOR Reduction (vph)	0	17	0	0	30	0	0	2	0	0	1	0
Lane Group Flow (vph)	15	60	0	76	41	0	18	754	0	25	917	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	5.9	5.9		5.9	5.9		0.7	17.3		0.7	17.3	
Effective Green, g (s)	5.9	5.9		5.9	5.9		0.7	17.3		0.7	17.3	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.02	0.46		0.02	0.46	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	208	279		207	271		33	1623		33	1629	
v/s Ratio Prot		0.03			0.02		0.01	0.21		0.01	0.26	
v/s Ratio Perm	0.01			0.06								
v/c Ratio	0.07	0.22		0.37	0.15		0.55	0.46		0.76	0.56	
Uniform Delay, d1	13.5	13.8		14.1	13.6		18.2	6.9		18.3	7.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.4	0.1		9.5	0.1		59.5	0.3	
Delay (s)	13.5	13.9		14.5	13.7		27.7	7.0		77.9	7.6	
Level of Service	B	B		B	B		C	A		E	A	
Approach Delay (s)		13.9			14.1			7.5			9.5	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			9.2			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			37.5			Sum of lost time (s)			13.6			
Intersection Capacity Utilization			38.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

13: 8Th Street & P Street



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	17	35	3	9	46	14	13	181	11	13	177	2
Peak Hour Factor	0.75	0.75	0.75	0.82	0.82	0.82	0.71	0.71	0.71	0.76	0.76	0.76
Hourly flow rate (vph)	23	47	4	11	56	17	18	255	15	17	233	3
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	73	84	18	270	17	236						
Volume Left (vph)	23	11	18	0	17	0						
Volume Right (vph)	4	17	0	15	0	3						
Hadj (s)	0.06	-0.06	0.53	-0.01	0.53	0.03						
Departure Headway (s)	5.4	5.3	5.7	5.2	5.8	5.3						
Degree Utilization, x	0.11	0.12	0.03	0.39	0.03	0.34						
Capacity (veh/h)	594	610	604	671	597	660						
Control Delay (s)	9.1	9.0	7.7	10.3	7.7	9.8						
Approach Delay (s)	9.1	9.0	10.1		9.6							
Approach LOS	A	A	B		A							
Intersection Summary												
Delay			9.7									
HCM Level of Service			A									
Intersection Capacity Utilization			23.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: 8Th Street & P Street
























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	58	21	32	65	28	17	213	22	25	237	23
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.85	0.85	0.85
Hourly flow rate (vph)	23	66	24	39	79	34	18	229	24	29	279	27
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	112	152	18	253	29	306						
Volume Left (vph)	23	39	18	0	29	0						
Volume Right (vph)	24	34	0	24	0	27						
Hadj (s)	-0.05	-0.05	0.53	-0.03	0.53	-0.03						
Departure Headway (s)	5.7	5.7	6.3	5.7	6.2	5.6						
Degree Utilization, x	0.18	0.24	0.03	0.40	0.05	0.48						
Capacity (veh/h)	556	571	546	603	554	617						
Control Delay (s)	10.0	10.4	8.3	11.2	8.3	12.4						
Approach Delay (s)	10.0	10.4	11.0		12.1							
Approach LOS	A	B	B		B							
Intersection Summary												
Delay			11.2									
HCM Level of Service			B									
Intersection Capacity Utilization			37.3%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

14: California Avenue & Real Rd






























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	1140	58	116	924	245	78	61	273	347	142	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3		3.7	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00	0.88	1.00	0.95	0.95
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5048		1770	5085	1583	1770	1863	2787	1770	1586	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5048		1770	5085	1583	1770	1863	2787	1770	1586	1504
Peak-hour factor, PHF	0.82	0.82	0.82	0.88	0.88	0.88	0.90	0.90	0.90	0.85	0.85	0.85
Adj. Flow (vph)	139	1390	71	132	1050	278	87	68	303	408	167	892
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	259	0	84	382
Lane Group Flow (vph)	139	1455	0	132	1050	278	87	68	44	408	458	135
Turn Type	Prot			Prot		Free	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						Free			3			4
Actuated Green, G (s)	10.0	25.8		10.0	25.8	84.0	12.1	12.1	12.1	19.1	19.1	19.1
Effective Green, g (s)	10.0	25.8		10.0	25.8	84.0	12.1	12.1	12.1	19.1	19.1	19.1
Actuated g/C Ratio	0.12	0.31		0.12	0.31	1.00	0.14	0.14	0.14	0.23	0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.1		2.0	4.5		4.5	4.5	4.5	7.1	7.1	7.1
Lane Grp Cap (vph)	211	1550		211	1562	1583	255	268	401	402	361	342
v/s Ratio Prot	0.08	c0.29		0.07	c0.21		c0.05	0.04		0.23	c0.29	
v/s Ratio Perm						0.18			0.02			0.09
v/c Ratio	0.66	0.94		0.63	0.67	0.18	0.34	0.25	0.11	1.01	1.27	0.39
Uniform Delay, d1	35.4	28.3		35.2	25.4	0.0	32.4	31.9	31.3	32.5	32.5	27.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	11.4		4.1	1.4	0.2	1.4	0.9	0.2	48.7	140.8	2.7
Delay (s)	40.9	39.8		39.3	26.8	0.2	33.7	32.8	31.5	81.2	173.3	30.2
Level of Service	D	D		D	C	A	C	C	C	F	F	C
Approach Delay (s)		39.9			22.9			32.1			97.2	
Approach LOS		D			C			C			F	
Intersection Summary												
HCM Average Control Delay			51.1			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			84.0			Sum of lost time (s)			13.3			
Intersection Capacity Utilization			72.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: California Avenue & Real Rd


























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  				 		 	
Volume (vph)	266	1439	108	188	1155	690	74	51	216	276	207	675
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3		3.7	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00	0.88	1.00	0.95	0.95
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5032		1770	5085	1583	1770	1863	2787	1770	1624	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5032		1770	5085	1583	1770	1863	2787	1770	1624	1504
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.80	0.80	0.80	0.91	0.91	0.91
Adj. Flow (vph)	280	1515	114	207	1269	758	92	64	270	303	227	742
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	231	0	46	363
Lane Group Flow (vph)	280	1620	0	207	1269	758	92	64	39	303	456	104
Turn Type	Prot			Prot		Free	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						Free			3			4
Actuated Green, G (s)	11.3	25.8		12.3	26.8	86.6	12.5	12.5	12.5	19.0	19.0	19.0
Effective Green, g (s)	11.3	25.8		12.3	26.8	86.6	12.5	12.5	12.5	19.0	19.0	19.0
Actuated g/C Ratio	0.13	0.30		0.14	0.31	1.00	0.14	0.14	0.14	0.22	0.22	0.22
Clearance Time (s)	3.7	5.3		3.7	5.3		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.1		2.0	4.5		4.5	4.5	4.5	7.1	7.1	7.1
Lane Grp Cap (vph)	231	1499		251	1574	1583	255	269	402	388	356	330
v/s Ratio Prot	c0.16	c0.32		0.12	c0.25		0.05	0.03		0.17	c0.28	
v/s Ratio Perm						c0.48			0.01			0.07
v/c Ratio	1.21	1.08		0.82	0.81	0.48	0.36	0.24	0.10	0.78	1.28	0.32
Uniform Delay, d1	37.6	30.4		36.1	27.5	0.0	33.4	32.8	32.2	31.8	33.8	28.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	128.5	48.4		18.5	3.5	1.0	1.5	0.8	0.2	12.8	146.3	2.0
Delay (s)	166.2	78.8		54.6	31.0	1.0	34.9	33.6	32.3	44.7	180.1	30.3
Level of Service	F	E		D	C	A	C	C	C	D	F	C
Approach Delay (s)		91.6			23.0			33.1			92.8	
Approach LOS		F			C			C			F	
Intersection Summary												
HCM Average Control Delay			61.4			HCM Level of Service			E			
HCM Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			86.6			Sum of lost time (s)			7.7			
Intersection Capacity Utilization			84.7%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: California Ave & parking lot


























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Volume (vph)	10	1308	452	0	1067	12	479	16	705	17	0	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			5.3	5.3	4.6	4.6	4.6	3.7		3.7
Lane Util. Factor	1.00	0.91			0.91	1.00	0.95	0.95	1.00	1.00		1.00
Frt	1.00	0.96			1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00	0.95		1.00
Satd. Flow (prot)	1770	4889			5085	1583	1681	1691	1583	1770		1583
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00	0.61		1.00
Satd. Flow (perm)	1770	4889			5085	1583	1681	1691	1583	1129		1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.76	0.76	0.76	0.75	0.75	0.75
Adj. Flow (vph)	12	1521	526	0	1199	13	630	21	928	23	0	37
RTOR Reduction (vph)	0	42	0	0	0	3	0	0	251	0	0	35
Lane Group Flow (vph)	12	2005	0	0	1199	10	328	323	677	23	0	2
Turn Type	Prot					Prot	Split		Perm	custom		custom
Protected Phases	5	2			6	6	3	3				
Permitted Phases									3	4		4
Actuated Green, G (s)	1.3	58.3			52.9	52.9	25.5	25.5	25.5	6.6		6.6
Effective Green, g (s)	1.3	58.3			52.9	52.9	25.5	25.5	25.5	6.6		6.6
Actuated g/C Ratio	0.01	0.56			0.51	0.51	0.25	0.25	0.25	0.06		0.06
Clearance Time (s)	3.7	4.9			5.3	5.3	4.6	4.6	4.6	3.7		3.7
Vehicle Extension (s)	2.0	5.1			4.2	4.2	5.0	5.0	5.0	1.5		1.5
Lane Grp Cap (vph)	22	2751			2596	808	414	416	390	72		101
v/s Ratio Prot	0.01	c0.41			0.24	0.01	0.20	0.19				
v/s Ratio Perm									c0.43	c0.02		0.00
v/c Ratio	0.55	0.73			0.46	0.01	0.79	0.78	1.74	0.32		0.02
Uniform Delay, d1	50.9	16.8			16.2	12.5	36.6	36.4	39.0	46.4		45.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	14.0	1.2			0.2	0.0	11.4	10.2	341.7	0.9		0.0
Delay (s)	64.8	18.0			16.4	12.5	48.0	46.6	380.7	47.3		45.5
Level of Service	E	B			B	B	D	D	F	D		D
Approach Delay (s)		18.3			16.4			243.2			46.2	
Approach LOS		B			B			F			C	
Intersection Summary												
HCM Average Control Delay			90.5				HCM Level of Service		F			
HCM Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			103.6				Sum of lost time (s)		13.2			
Intersection Capacity Utilization			93.6%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: California Ave & parking lot

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Volume (vph)	69	1168	686	0	1944	31	301	9	356	18	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			5.3	5.3	4.6	4.6	4.6	3.7		3.7
Lane Util. Factor	1.00	0.91			0.91	1.00	0.95	0.95	1.00	1.00		1.00
Frt	1.00	0.94			1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00	0.95		1.00
Satd. Flow (prot)	1770	4803			5085	1583	1681	1690	1583	1770		1583
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00	0.66		1.00
Satd. Flow (perm)	1770	4803			5085	1583	1681	1690	1583	1221		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.86	0.86	0.86	0.91	0.91	0.91	0.93	0.93	0.93
Adj. Flow (vph)	73	1229	722	0	2260	36	331	10	391	19	0	65
RTOR Reduction (vph)	0	67	0	0	0	6	0	0	279	0	0	61
Lane Group Flow (vph)	73	1884	0	0	2260	30	169	172	112	19	0	4
Turn Type	Prot					Prot	Split		Perm	custom		custom
Protected Phases	5	2			6	6	3	3				
Permitted Phases									3	4		4
Actuated Green, G (s)	7.1	56.6			45.4	45.4	19.9	19.9	19.9	6.1		6.1
Effective Green, g (s)	7.1	56.6			45.4	45.4	19.9	19.9	19.9	6.1		6.1
Actuated g/C Ratio	0.07	0.59			0.47	0.47	0.21	0.21	0.21	0.06		0.06
Clearance Time (s)	3.7	4.9			5.3	5.3	4.6	4.6	4.6	3.7		3.7
Vehicle Extension (s)	2.0	5.1			4.2	4.2	5.0	5.0	5.0	1.5		1.5
Lane Grp Cap (vph)	131	2838			2410	750	349	351	329	78		101
v/s Ratio Prot	0.04	c0.39			c0.44	0.02	0.10	c0.10				
v/s Ratio Perm									0.07	c0.02		0.00
v/c Ratio	0.56	0.66			0.94	0.04	0.48	0.49	0.34	0.24		0.04
Uniform Delay, d1	42.8	13.2			23.9	13.5	33.4	33.5	32.4	42.7		42.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	2.9	0.8			8.0	0.0	2.2	2.2	1.3	0.6		0.1
Delay (s)	45.7	14.0			31.8	13.5	35.6	35.7	33.7	43.2		42.2
Level of Service	D	B			C	B	D	D	C	D		D
Approach Delay (s)		15.1			31.5			34.6			42.4	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay			25.7		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			95.8		Sum of lost time (s)				18.5			
Intersection Capacity Utilization			74.6%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: California Ave & OAK STREET

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	765	1124	116	52	585	118	229	485	82	90	210	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	5085	1583	3433	4975		1770	3203	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	5085	1583	3433	4975		1770	3203	1441
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.75	0.75	0.75	0.88	0.88	0.88
Adj. Flow (vph)	823	1209	125	58	650	131	305	647	109	102	239	309
RTOR Reduction (vph)	0	0	47	0	0	76	0	17	0	0	58	144
Lane Group Flow (vph)	823	1209	78	58	650	55	305	739	0	102	320	26
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	3	8		7	4		6	6		2	2	
Permitted Phases			8			4						2
Actuated Green, G (s)	15.7	35.9	35.9	4.7	24.9	24.9	21.3	21.3		15.0	15.0	15.0
Effective Green, g (s)	15.7	35.9	35.9	4.7	24.9	24.9	21.3	21.3		15.0	15.0	15.0
Actuated g/C Ratio	0.16	0.37	0.37	0.05	0.26	0.26	0.22	0.22		0.15	0.15	0.15
Clearance Time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	1.0	2.0	2.0	0.5	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	556	1310	586	166	1305	406	754	1092		274	495	223
v/s Ratio Prot	c0.24	c0.34		0.02	c0.13		0.09	c0.15		0.06	c0.10	
v/s Ratio Perm			0.05			0.03						0.02
v/c Ratio	1.48	0.92	0.13	0.35	0.50	0.14	0.40	0.68		0.37	0.65	0.12
Uniform Delay, d1	40.6	29.2	20.2	44.7	30.7	27.8	32.4	34.7		36.8	38.5	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	225.7	10.7	0.0	0.5	0.1	0.1	0.1	1.3		0.3	2.2	0.1
Delay (s)	266.3	40.0	20.3	45.1	30.8	27.8	32.5	36.0		37.1	40.7	35.4
Level of Service	F	D	C	D	C	C	C	D		D	D	D
Approach Delay (s)		125.2			31.4			35.0			38.7	
Approach LOS		F			C			D			D	

























Intersection Summary

HCM Average Control Delay	76.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

16: California Ave & OAK STREET





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	494	823	206	177	1070	104	268	381	59	134	592	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	5085	1583	3433	4983		1770	3240	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	5085	1583	3433	4983		1770	3240	1441
Peak-hour factor, PHF	0.93	0.93	0.93	0.79	0.79	0.79	0.88	0.88	0.88	0.85	0.85	0.85
Adj. Flow (vph)	531	885	222	224	1354	132	305	433	67	158	696	727
RTOR Reduction (vph)	0	0	129	0	0	35	0	17	0	0	29	218
Lane Group Flow (vph)	531	885	93	224	1354	97	305	483	0	158	958	218
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	3	8		7	4		6	6		2	2	
Permitted Phases			8			4						2
Actuated Green, G (s)	15.4	35.1	35.1	15.4	35.1	35.1	17.6	17.6		34.7	34.7	34.7
Effective Green, g (s)	15.4	35.1	35.1	15.4	35.1	35.1	17.6	17.6		34.7	34.7	34.7
Actuated g/C Ratio	0.13	0.29	0.29	0.13	0.29	0.29	0.14	0.14		0.28	0.28	0.28
Clearance Time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	1.0	2.0	2.0	0.5	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	430	1011	452	430	1452	452	492	714		500	915	407
v/s Ratio Prot	c0.15	0.25		0.07	c0.27		0.09	c0.10		0.09	c0.30	
v/s Ratio Perm			0.06			0.06						0.15
v/c Ratio	1.23	0.88	0.21	0.52	0.93	0.21	0.62	0.68		0.32	1.05	0.54
Uniform Delay, d1	53.8	41.8	33.3	50.3	42.7	33.4	49.5	49.9		34.7	44.1	37.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	124.4	8.3	0.1	0.5	11.0	0.1	1.6	2.0		0.1	42.9	0.7
Delay (s)	178.1	50.2	33.4	50.8	53.7	33.5	51.1	52.0		34.9	87.0	38.0
Level of Service	F	D	C	D	D	C	D	D		C	F	D
Approach Delay (s)		89.4			51.8			51.6			68.3	
Approach LOS		F			D			D			E	
Intersection Summary												
HCM Average Control Delay			67.1			HCM Level of Service			E			
HCM Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			122.9			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			82.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: California Ave & Campus Way





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	284	1007	49	50	548	45	55	66	95	13	40	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3515		1770	5028		1770	1698		1770	1640	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3515		1770	5028		1770	1698		1770	1640	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.81	0.81	0.81	0.75	0.75	0.75
Adj. Flow (vph)	330	1171	57	58	637	52	68	81	117	17	53	207
RTOR Reduction (vph)	0	3	0	0	10	0	0	51	0	0	155	0
Lane Group Flow (vph)	330	1225	0	58	679	0	68	147	0	17	105	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	16.9	35.0		3.9	22.0		8.5	16.4		0.9	9.3	
Effective Green, g (s)	16.9	35.0		3.9	22.0		8.5	16.4		0.9	9.3	
Actuated g/C Ratio	0.23	0.47		0.05	0.30		0.11	0.22		0.01	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Vehicle Extension (s)	1.5	2.0		1.0	2.0		1.5	1.5		1.0	1.5	
Lane Grp Cap (vph)	402	1651		93	1485		202	374		21	205	
v/s Ratio Prot	c0.19	c0.35		0.03	0.14		0.04	c0.09		0.01	c0.06	
v/s Ratio Perm												
v/c Ratio	0.82	0.74		0.62	0.46		0.34	0.39		0.81	0.51	
Uniform Delay, d1	27.4	16.1		34.6	21.4		30.4	24.8		36.7	30.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.1	1.6		9.0	0.1		0.4	0.2		104.9	0.9	
Delay (s)	39.4	17.7		43.6	21.5		30.8	25.1		141.6	31.4	
Level of Service	D	B		D	C		C	C		F	C	
Approach Delay (s)		22.3			23.2			26.5			38.1	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			24.5			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			74.5			Sum of lost time (s)			8.5			
Intersection Capacity Utilization			65.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: California Ave & Campus Way







5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	819	34	85	1255	10	18	11	57	3	25	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3518		1770	5079		1770	1629		1770	1671	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3518		1770	5079		1770	1629		1770	1671	
Peak-hour factor, PHF	0.91	0.91	0.91	0.78	0.78	0.78	0.80	0.80	0.80	0.71	0.71	0.71
Adj. Flow (vph)	78	900	37	109	1609	13	22	14	71	4	35	76
RTOR Reduction (vph)	0	2	0	0	1	0	0	63	0	0	70	0
Lane Group Flow (vph)	78	935	0	109	1621	0	22	22	0	4	41	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	5.4	29.0		5.9	29.5		2.8	6.5		0.8	5.0	
Effective Green, g (s)	5.4	29.0		5.9	29.5		2.8	6.5		0.8	5.0	
Actuated g/C Ratio	0.09	0.48		0.10	0.49		0.05	0.11		0.01	0.08	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Vehicle Extension (s)	1.5	2.0		1.0	2.0		1.5	1.5		1.0	1.5	
Lane Grp Cap (vph)	158	1686		173	2477		82	175		23	138	
v/s Ratio Prot	0.04	0.27		c0.06	c0.32		c0.01	c0.01		0.00	c0.02	
v/s Ratio Perm												
v/c Ratio	0.49	0.55		0.63	0.65		0.27	0.12		0.17	0.30	
Uniform Delay, d1	26.2	11.2		26.3	11.7		27.9	24.4		29.5	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2		5.4	0.5		0.6	0.1		1.3	0.4	
Delay (s)	27.1	11.4		31.6	12.1		28.5	24.5		30.8	26.5	
Level of Service	C	B		C	B		C	C		C	C	
Approach Delay (s)		12.6			13.4			25.4			26.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			14.1			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			60.5			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			48.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: California Ave & Oleander Ave







5/24/2011

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	
Volume (vph)	1169	19	98	554	45	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0	5.0	4.0	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	5073		1770	5085	1683	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	5073		1770	5085	1683	
Peak-hour factor, PHF	0.83	0.83	0.85	0.85	0.77	0.77
Adj. Flow (vph)	1408	23	115	652	58	78
RTOR Reduction (vph)	1	0	0	0	51	0
Lane Group Flow (vph)	1430	0	115	652	85	0
Turn Type			Prot			
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	36.8		6.7	47.5	8.2	
Effective Green, g (s)	36.8		6.7	47.5	8.2	
Actuated g/C Ratio	0.57		0.10	0.73	0.13	
Clearance Time (s)	5.0		4.0	5.0	4.0	
Vehicle Extension (s)	4.0		1.0	4.0	1.5	
Lane Grp Cap (vph)	2885		183	3733	213	
v/s Ratio Prot	c0.28		c0.06	0.13	c0.05	
v/s Ratio Perm						
v/c Ratio	0.50		0.63	0.17	0.40	
Uniform Delay, d1	8.4		27.8	2.6	26.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		4.8	0.0	0.5	
Delay (s)	8.6		32.6	2.7	26.4	
Level of Service	A		C	A	C	
Approach Delay (s)	8.6			7.1	26.4	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			9.1	HCM Level of Service		A
HCM Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			64.7	Sum of lost time (s)		13.0
Intersection Capacity Utilization			45.4%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

18: California Ave & Oleander Ave





















5/24/2011

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑	
Volume (vph)	820	68	69	1258	35	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0	5.0	4.0	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	5027		1770	5085	1676	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	5027		1770	5085	1676	
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.83	0.83
Adj. Flow (vph)	872	72	77	1398	42	66
RTOR Reduction (vph)	6	0	0	0	59	0
Lane Group Flow (vph)	938	0	77	1398	49	0
Turn Type			Prot			
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	25.3		3.7	33.0	5.0	
Effective Green, g (s)	25.3		3.7	33.0	5.0	
Actuated g/C Ratio	0.54		0.08	0.70	0.11	
Clearance Time (s)	5.0		4.0	5.0	4.0	
Vehicle Extension (s)	4.0		1.0	4.0	1.5	
Lane Grp Cap (vph)	2706		139	3570	178	
v/s Ratio Prot	0.19		c0.04	c0.27	c0.03	
v/s Ratio Perm						
v/c Ratio	0.35		0.55	0.39	0.28	
Uniform Delay, d1	6.2		20.9	2.9	19.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.1		2.7	0.1	0.3	
Delay (s)	6.3		23.6	3.0	19.6	
Level of Service	A		C	A	B	
Approach Delay (s)	6.3			4.0	19.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay			5.5	HCM Level of Service		A
HCM Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			47.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			37.3%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

19: California Ave & H Street





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	1001	60	44	528	32	90	468	114	83	220	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5042		1770	5042		1770	3435		1770	3365	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5042		1770	5042		1770	3435		1770	3365	
Peak-hour factor, PHF	0.84	0.84	0.84	0.82	0.82	0.82	0.82	0.82	0.82	0.67	0.67	0.67
Adj. Flow (vph)	130	1192	71	54	644	39	110	571	139	124	328	160
RTOR Reduction (vph)	0	5	0	0	6	0	0	25	0	0	70	0
Lane Group Flow (vph)	130	1258	0	54	677	0	110	685	0	124	418	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.6	26.2		4.5	17.1		12.1	21.5		7.4	16.8	
Effective Green, g (s)	13.6	26.2		4.5	17.1		12.1	21.5		7.4	16.8	
Actuated g/C Ratio	0.18	0.34		0.06	0.22		0.16	0.28		0.10	0.22	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	311	1707		103	1114		277	954		169	730	
v/s Ratio Prot	0.07	c0.25		0.03	c0.13		0.06	c0.20		c0.07	0.12	
v/s Ratio Perm												
v/c Ratio	0.42	0.74		0.52	0.61		0.40	0.72		0.73	0.57	
Uniform Delay, d1	28.4	22.6		35.4	27.1		29.4	25.2		34.0	27.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.5		2.2	0.6		0.3	2.2		13.2	0.7	
Delay (s)	28.7	24.0		37.6	27.8		29.7	27.4		47.3	27.8	
Level of Service	C	C		D	C		C	C		D	C	
Approach Delay (s)		24.5			28.5			27.7			31.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			27.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			77.4			Sum of lost time (s)			18.7			
Intersection Capacity Utilization			65.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

19: California Ave & H Street























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	932	81	143	1047	69	77	491	114	88	578	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5024		1770	5038		1770	3439		1770	3453	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5024		1770	5038		1770	3439		1770	3453	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.90	0.90	0.90	0.98	0.98	0.98
Adj. Flow (vph)	166	1002	87	155	1138	75	86	546	127	90	590	114
RTOR Reduction (vph)	0	9	0	0	7	0	0	23	0	0	18	0
Lane Group Flow (vph)	166	1080	0	155	1206	0	86	650	0	90	686	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.3	22.4		10.5	21.6		9.1	23.7		7.0	21.6	
Effective Green, g (s)	11.3	22.4		10.5	21.6		9.1	23.7		7.0	21.6	
Actuated g/C Ratio	0.14	0.28		0.13	0.27		0.11	0.29		0.09	0.27	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	246	1383		228	1337		198	1001		152	916	
v/s Ratio Prot	0.09	c0.21		0.09	c0.24		0.05	c0.19		0.05	c0.20	
v/s Ratio Perm												
v/c Ratio	0.67	0.78		0.68	0.90		0.43	0.65		0.59	0.75	
Uniform Delay, d1	33.3	27.2		33.8	28.9		33.7	25.2		35.8	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	2.7		6.2	8.5		0.6	1.1		4.1	3.0	
Delay (s)	38.9	29.9		40.0	37.4		34.3	26.3		39.9	30.4	
Level of Service	D	C		D	D		C	C		D	C	
Approach Delay (s)		31.1			37.7			27.2			31.5	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay			32.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			81.4			Sum of lost time (s)			9.8			
Intersection Capacity Utilization			74.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

20: California Ave & Chester Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	354	773	45	63	425	60	79	490	149	77	194	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3510		3433	4991		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3510		3433	4991		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.75	0.75	0.75	0.94	0.94	0.94	0.66	0.66	0.66	0.92	0.92	0.92
Adj. Flow (vph)	472	1031	60	67	452	64	120	742	226	84	211	79
RTOR Reduction (vph)	0	2	0	0	15	0	0	0	66	0	0	71
Lane Group Flow (vph)	472	1089	0	67	501	0	120	742	160	84	211	8
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	34.7	45.8		4.5	15.6		24.8	28.6	28.6	7.2	11.0	11.0
Effective Green, g (s)	34.7	45.8		4.5	15.6		24.8	28.6	28.6	7.2	11.0	11.0
Actuated g/C Ratio	0.33	0.44		0.04	0.15		0.24	0.28	0.28	0.07	0.11	0.11
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	1150	1552		149	752		424	977	437	123	376	168
v/s Ratio Prot	0.14	c0.31		0.02	c0.10		0.07	c0.21		c0.05	0.06	
v/s Ratio Perm									0.10			0.01
v/c Ratio	0.41	0.70		0.45	0.67		0.28	0.76	0.37	0.68	0.56	0.05
Uniform Delay, d1	26.6	23.4		48.3	41.5		32.1	34.3	30.2	47.1	44.0	41.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.2		0.8	1.7		0.1	3.1	0.2	11.8	1.1	0.0
Delay (s)	26.7	24.6		49.1	43.3		32.3	37.4	30.4	58.8	45.2	41.6
Level of Service	C	C		D	D		C	D	C	E	D	D
Approach Delay (s)		25.2			43.9			35.4			47.5	
Approach LOS		C			D			D			D	























Intersection Summary

HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	103.6	Sum of lost time (s)	18.1
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

20: California Ave & Chester Ave






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	283	749	77	211	1031	92	74	449	136	67	386	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3489		3433	5023		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3489		3433	5023		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.73	0.73	0.73	0.82	0.82	0.82	0.80	0.80	0.80
Adj. Flow (vph)	325	861	89	289	1412	126	90	548	166	84	482	129
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	70	0	0	105
Lane Group Flow (vph)	325	946	0	289	1532	0	90	548	96	84	482	24
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	14.2	46.0		13.1	44.9		11.9	24.5	24.5	7.7	20.3	20.3
Effective Green, g (s)	14.2	46.0		13.1	44.9		11.9	24.5	24.5	7.7	20.3	20.3
Actuated g/C Ratio	0.13	0.42		0.12	0.41		0.11	0.23	0.23	0.07	0.19	0.19
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	448	1475		413	2073		194	797	356	125	660	295
v/s Ratio Prot	0.09	c0.27		0.08	c0.31		c0.05	c0.15		c0.05	0.14	
v/s Ratio Perm									0.06			0.02
v/c Ratio	0.73	0.64		0.70	0.74		0.46	0.69	0.27	0.67	0.73	0.08
Uniform Delay, d1	45.4	24.9		46.0	27.0		45.5	38.6	34.8	49.3	41.7	36.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	0.7		4.2	1.2		0.6	2.0	0.1	10.6	3.6	0.0
Delay (s)	50.3	25.6		50.1	28.2		46.1	40.6	34.9	59.9	45.3	36.6
Level of Service	D	C		D	C		D	D	C	E	D	D
Approach Delay (s)		31.9			31.7			40.1			45.4	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay			35.3			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			108.8			Sum of lost time (s)			17.5			
Intersection Capacity Utilization			60.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

21: California Ave & N Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	807	5	17	532	11	4	2	1	6	6	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	0.95	0.95
Frt	1.00	1.00		1.00	1.00		1.00	0.96		1.00	0.94	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5081		1770	5070		1770	1783		1770	1658	1504
Flt Permitted	0.95	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00
Satd. Flow (perm)	1770	5081		1770	5070		1863	1783		1863	1658	1504
Peak-hour factor, PHF	0.72	0.72	0.72	0.92	0.92	0.92	0.44	0.44	0.44	0.54	0.54	0.54
Adj. Flow (vph)	49	1121	7	18	578	12	9	5	2	11	11	26
RTOR Reduction (vph)	0	0	0	0	2	0	0	2	0	0	8	17
Lane Group Flow (vph)	49	1128	0	18	588	0	9	5	0	11	11	1
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	1.6	15.4		0.6	14.4		1.4	1.4		1.4	1.4	1.4
Effective Green, g (s)	1.6	15.4		0.6	14.4		1.4	1.4		1.4	1.4	1.4
Actuated g/C Ratio	0.05	0.51		0.02	0.48		0.05	0.05		0.05	0.05	0.05
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5		1.5	1.5	1.5
Lane Grp Cap (vph)	93	2582		35	2410		86	82		86	77	69
v/s Ratio Prot	c0.03	c0.22		0.01	0.12			0.00			c0.01	
v/s Ratio Perm							0.00			0.01		0.00
v/c Ratio	0.53	0.44		0.51	0.24		0.10	0.06		0.13	0.15	0.01
Uniform Delay, d1	14.0	4.7		14.7	4.7		13.8	13.8		13.9	13.9	13.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	0.0		5.2	0.0		0.2	0.1		0.2	0.3	0.0
Delay (s)	16.5	4.8		19.9	4.7		14.0	13.9		14.1	14.2	13.8
Level of Service	B	A		B	A		B	B		B	B	B
Approach Delay (s)		5.2			5.2			14.0			14.0	
Approach LOS		A			A			B			B	






















Intersection Summary

HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	30.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

21: California Ave & N Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	863	10	12	997	13	1	34	11	7	24	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	0.95	0.95
Frt	1.00	1.00		1.00	1.00		1.00	0.96		1.00	0.99	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5077		1770	5075		1770	1795		1770	1747	1504
Flt Permitted	0.95	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00
Satd. Flow (perm)	1770	5077		1770	5075		1863	1795		1863	1747	1504
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.82	0.82	0.82	0.56	0.56	0.56
Adj. Flow (vph)	58	981	11	13	1120	15	1	41	13	12	43	41
RTOR Reduction (vph)	0	1	0	0	1	0	0	12	0	0	4	34
Lane Group Flow (vph)	58	991	0	13	1134	0	1	42	0	12	43	3
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	2.8	21.7		0.6	19.5		2.8	2.8		2.8	2.8	2.8
Effective Green, g (s)	2.8	21.7		0.6	19.5		2.8	2.8		2.8	2.8	2.8
Actuated g/C Ratio	0.07	0.57		0.02	0.51		0.07	0.07		0.07	0.07	0.07
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5		1.5	1.5	1.5
Lane Grp Cap (vph)	130	2899		28	2604		137	132		137	129	111
v/s Ratio Prot	c0.03	0.20		0.01	c0.22			0.02			c0.02	
v/s Ratio Perm							0.00			0.01		0.00
v/c Ratio	0.45	0.34		0.46	0.44		0.01	0.32		0.09	0.34	0.02
Uniform Delay, d1	16.9	4.3		18.5	5.8		16.3	16.7		16.4	16.7	16.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.0		4.4	0.0		0.0	0.5		0.1	0.6	0.0
Delay (s)	17.7	4.4		22.9	5.8		16.3	17.2		16.5	17.3	16.4
Level of Service	B	A		C	A		B	B		B	B	B
Approach Delay (s)		5.1			6.0			17.2			16.8	
Approach LOS		A			A			B			B	

Intersection Summary






















HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	38.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

22: California Ave & P Street






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	608	25	37	480	41	31	147	47	20	90	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5055		1770	5025		1770	1795		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5055		1770	5025		1770	1795		1770	1863	1583
Peak-hour factor, PHF	0.71	0.71	0.71	0.87	0.87	0.87	0.84	0.84	0.84	0.72	0.72	0.72
Adj. Flow (vph)	248	856	35	43	552	47	37	175	56	28	125	76
RTOR Reduction (vph)	0	2	0	0	6	0	0	8	0	0	0	59
Lane Group Flow (vph)	248	889	0	43	593	0	37	223	0	28	125	17
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	9.0	22.2		3.3	16.5		3.1	14.1		1.9	12.9	12.9
Effective Green, g (s)	9.0	22.2		3.3	16.5		3.1	14.1		1.9	12.9	12.9
Actuated g/C Ratio	0.15	0.38		0.06	0.28		0.05	0.24		0.03	0.22	0.22
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	523	1899		99	1403		93	428		57	407	346
v/s Ratio Prot	c0.07	c0.18		0.02	0.12		c0.02	c0.12		0.02	0.07	
v/s Ratio Perm												0.01
v/c Ratio	0.47	0.47		0.43	0.42		0.40	0.52		0.49	0.31	0.05
Uniform Delay, d1	22.9	14.0		27.0	17.4		27.1	19.6		28.1	19.4	18.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		1.1	0.1		1.0	0.5		2.4	0.2	0.0
Delay (s)	23.1	14.0		28.1	17.5		28.1	20.1		30.5	19.5	18.3
Level of Service	C	B		C	B		C	C		C	B	B
Approach Delay (s)		16.0			18.2			21.2			20.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			17.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			59.1			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			43.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: California Ave & P Street






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	237	599	28	54	814	84	27	168	36	40	150	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5051		1770	5014		1770	1813		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5051		1770	5014		1770	1813		1770	1863	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.88	0.88	0.93	0.93	0.93
Adj. Flow (vph)	276	697	33	61	925	95	31	191	41	43	161	210
RTOR Reduction (vph)	0	3	0	0	8	0	0	5	0	0	0	164
Lane Group Flow (vph)	276	727	0	61	1012	0	31	227	0	43	161	46
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	11.0	30.1		5.6	24.7		3.1	15.6		3.5	16.0	16.0
Effective Green, g (s)	11.0	30.1		5.6	24.7		3.1	15.6		3.5	16.0	16.0
Actuated g/C Ratio	0.15	0.42		0.08	0.34		0.04	0.22		0.05	0.22	0.22
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	522	2100		137	1711		76	391		86	412	350
v/s Ratio Prot	c0.08	0.14		0.03	c0.20		0.02	c0.12		c0.02	0.09	
v/s Ratio Perm												0.03
v/c Ratio	0.53	0.35		0.45	0.59		0.41	0.58		0.50	0.39	0.13
Uniform Delay, d1	28.3	14.4		31.9	19.7		33.8	25.5		33.6	24.0	22.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0		0.8	0.4		1.3	1.3		1.7	0.2	0.1
Delay (s)	28.8	14.5		32.8	20.1		35.1	26.8		35.3	24.3	22.7
Level of Service	C	B		C	C		D	C		D	C	C
Approach Delay (s)		18.4			20.8			27.7			24.6	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay			21.1			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			72.4			Sum of lost time (s)			17.6			
Intersection Capacity Utilization			53.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: California Ave & Union Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	284	113	160	288	145	162	1187	143	161	702	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Lane Util. Factor	0.97	0.91		0.97	0.91		1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.96		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4868		3433	4830		1770	5003		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4868		3433	4830		1770	5003		1770	5085	1583
Peak-hour factor, PHF	0.81	0.81	0.81	0.90	0.90	0.90	0.80	0.80	0.80	0.76	0.76	0.76
Adj. Flow (vph)	241	351	140	178	320	161	202	1484	179	212	924	253
RTOR Reduction (vph)	0	55	0	0	71	0	0	10	0	0	0	120
Lane Group Flow (vph)	241	436	0	178	410	0	202	1653	0	212	924	133
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	11.7	19.8		9.8	17.9		16.0	36.1		16.6	36.7	36.7
Effective Green, g (s)	11.7	19.8		9.8	17.9		16.0	36.1		16.6	36.7	36.7
Actuated g/C Ratio	0.12	0.20		0.10	0.18		0.16	0.36		0.17	0.37	0.37
Clearance Time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Vehicle Extension (s)	2.0	5.2		2.0	5.2		2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	402	964		336	865		283	1806		294	1866	581
v/s Ratio Prot	c0.07	c0.09		0.05	0.08		0.11	c0.33		c0.12	0.18	
v/s Ratio Perm												0.08
v/c Ratio	0.60	0.45		0.53	0.47		0.71	0.92		0.72	0.50	0.23
Uniform Delay, d1	41.9	35.3		42.9	36.8		39.8	30.5		39.5	24.5	21.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	0.8		0.7	0.9		6.9	8.2		7.2	0.5	0.5
Delay (s)	43.5	36.1		43.6	37.7		46.8	38.7		46.7	24.9	22.3
Level of Service	D	D		D	D		D	D		D	C	C
Approach Delay (s)		38.5			39.3			39.5			27.8	
Approach LOS		D			D			D			C	






















Intersection Summary

HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

23: California Ave & Union Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	239	352	227	311	421	136	144	908	115	188	1155	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Lane Util. Factor	0.97	0.91		0.97	0.91		1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.94		1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4787		3433	4899		1770	5000		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4787		3433	4899		1770	5000		1770	5085	1583
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.91	0.91	0.91	0.79	0.79	0.79
Adj. Flow (vph)	295	435	280	362	490	158	158	998	126	238	1462	386
RTOR Reduction (vph)	0	86	0	0	42	0	0	11	0	0	0	120
Lane Group Flow (vph)	295	629	0	362	606	0	158	1113	0	238	1462	266
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	14.6	25.9		16.8	28.1		15.0	35.0		20.0	40.0	40.0
Effective Green, g (s)	14.6	25.9		16.8	28.1		15.0	35.0		20.0	40.0	40.0
Actuated g/C Ratio	0.13	0.22		0.15	0.24		0.13	0.30		0.17	0.35	0.35
Clearance Time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Vehicle Extension (s)	2.0	5.2		2.0	5.2		2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	434	1074		500	1193		230	1516		307	1763	549
v/s Ratio Prot	0.09	c0.13		c0.11	0.12		0.09	c0.22		0.13	c0.29	
v/s Ratio Perm												0.17
v/c Ratio	0.68	0.59		0.72	0.51		0.69	0.73		0.78	0.83	0.49
Uniform Delay, d1	48.2	40.0		47.1	37.7		48.0	36.0		45.6	34.6	29.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.3	1.3		4.4	0.8		6.6	2.3		10.6	3.8	1.5
Delay (s)	51.5	41.3		51.5	38.4		54.6	38.4		56.2	38.4	31.1
Level of Service	D	D		D	D		D	D		E	D	C
Approach Delay (s)		44.3			43.1			40.4			39.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay			41.1			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			115.4			Sum of lost time (s)			18.4			
Intersection Capacity Utilization			66.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: California Ave & King Street





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	338	39	68	468	9	105	38	61	24	18	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	5007		1770	5071			1797	1583		1811	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	5007		1770	5071			1797	1583		1811	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.82	0.82	0.82	0.74	0.74	0.74
Adj. Flow (vph)	38	402	46	78	538	10	128	46	74	32	24	39
RTOR Reduction (vph)	0	10	0	0	1	0	0	0	60	0	0	35
Lane Group Flow (vph)	38	438	0	78	547	0	0	174	14	0	56	4
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases									4			3
Actuated Green, G (s)	2.0	13.4		5.0	17.0			10.1	10.1		4.7	4.7
Effective Green, g (s)	2.0	13.4		5.0	17.0			10.1	10.1		4.7	4.7
Actuated g/C Ratio	0.04	0.26		0.10	0.33			0.19	0.19		0.09	0.09
Clearance Time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	68	1293		171	1661			350	308		164	143
v/s Ratio Prot	0.02	0.09		c0.04	c0.11			c0.10			c0.03	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.56	0.34		0.46	0.33			0.50	0.05		0.34	0.02
Uniform Delay, d1	24.5	15.6		22.2	13.2			18.6	17.0		22.1	21.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.5	0.1		0.7	0.0			0.4	0.0		0.5	0.0
Delay (s)	30.1	15.7		22.9	13.2			19.0	17.0		22.6	21.5
Level of Service	C	B		C	B			B	B		C	C
Approach Delay (s)		16.8			14.4			18.4			22.2	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay			16.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			51.9			Sum of lost time (s)			18.7			
Intersection Capacity Utilization			38.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: California Ave & King Street




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	565	40	55	493	6	69	13	74	5	3	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	5035		1770	5077			1788	1583		1808	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	5035		1770	5077			1788	1583		1808	1583
Peak-hour factor, PHF	0.76	0.76	0.76	0.95	0.95	0.95	0.81	0.81	0.81	0.80	0.80	0.80
Adj. Flow (vph)	42	743	53	58	519	6	85	16	91	6	4	30
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	79	0	0	29
Lane Group Flow (vph)	42	791	0	58	524	0	0	101	12	0	10	1
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases									4			3
Actuated Green, G (s)	2.7	16.9		3.0	17.8			6.0	6.0		2.2	2.2
Effective Green, g (s)	2.7	16.9		3.0	17.8			6.0	6.0		2.2	2.2
Actuated g/C Ratio	0.06	0.36		0.06	0.38			0.13	0.13		0.05	0.05
Clearance Time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	102	1818		113	1931			229	203		85	74
v/s Ratio Prot	0.02	c0.16		c0.03	0.10			c0.06			c0.01	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.41	0.44		0.51	0.27			0.44	0.06		0.12	0.02
Uniform Delay, d1	21.3	11.3		21.2	10.0			18.9	17.9		21.4	21.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.1		1.6	0.0			0.5	0.0		0.2	0.0
Delay (s)	22.3	11.4		22.8	10.0			19.3	18.0		21.6	21.3
Level of Service	C	B		C	B			B	B		C	C
Approach Delay (s)		11.9			11.3			18.7			21.4	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay			12.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			46.8			Sum of lost time (s)			18.7			
Intersection Capacity Utilization			38.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: California Ave & Owens Street




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	289	30	12	463	0	31	26	2	3	41	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			1.00	1.00
Satd. Flow (prot)	1770	5014		1770	5085			1807			1857	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97			1.00	1.00
Satd. Flow (perm)	1770	5014		1770	5085			1807			1857	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.91	0.91	0.91	0.64	0.64	0.64	0.58	0.58	0.58
Adj. Flow (vph)	9	332	34	13	509	0	48	41	3	5	71	12
RTOR Reduction (vph)	0	13	0	0	0	0	0	2	0	0	0	11
Lane Group Flow (vph)	9	353	0	13	509	0	0	90	0	0	76	1
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												4
Actuated Green, G (s)	0.5	12.8		0.7	13.0			3.1			3.1	3.1
Effective Green, g (s)	0.5	12.8		0.7	13.0			3.1			3.1	3.1
Actuated g/C Ratio	0.01	0.35		0.02	0.35			0.08			0.08	0.08
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Vehicle Extension (s)	1.5	2.0		1.0	2.0			1.0			1.5	1.5
Lane Grp Cap (vph)	24	1749		34	1801			153			157	134
v/s Ratio Prot	0.01	0.07		c0.01	c0.10			c0.05			c0.04	
v/s Ratio Perm												0.00
v/c Ratio	0.38	0.20		0.38	0.28			0.59			0.48	0.01
Uniform Delay, d1	17.9	8.4		17.8	8.5			16.2			16.0	15.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	3.6	0.0		2.6	0.0			3.7			0.9	0.0
Delay (s)	21.5	8.4		20.4	8.5			19.9			16.9	15.4
Level of Service	C	A		C	A			B			B	B
Approach Delay (s)		8.7			8.8			19.9			16.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			10.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			36.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			29.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: California Ave & Owens Street






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	499	90	25	423	9	69	29	30	6	28	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frt	1.00	0.98		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	1.00
Satd. Flow (prot)	1770	4969		1770	5069			1756			1846	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.99	1.00
Satd. Flow (perm)	1770	4969		1770	5069			1756			1846	1583
Peak-hour factor, PHF	0.78	0.78	0.78	0.92	0.92	0.92	0.67	0.67	0.67	0.79	0.79	0.79
Adj. Flow (vph)	35	640	115	27	460	10	103	43	45	8	35	53
RTOR Reduction (vph)	0	28	0	0	3	0	0	12	0	0	0	49
Lane Group Flow (vph)	35	727	0	27	467	0	0	179	0	0	43	4
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												4
Actuated Green, G (s)	1.1	15.4		1.6	15.9			7.0			3.0	3.0
Effective Green, g (s)	1.1	15.4		1.6	15.9			7.0			3.0	3.0
Actuated g/C Ratio	0.03	0.35		0.04	0.36			0.16			0.07	0.07
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Vehicle Extension (s)	1.5	2.0		1.0	2.0			1.0			1.5	1.5
Lane Grp Cap (vph)	44	1739		64	1832			279			126	108
v/s Ratio Prot	c0.02	c0.15		0.02	0.09			c0.10			c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.80	0.42		0.42	0.26			0.64			0.34	0.03
Uniform Delay, d1	21.3	10.9		20.7	9.9			17.3			19.6	19.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	59.8	0.1		1.6	0.0			3.8			0.6	0.0
Delay (s)	81.1	10.9		22.4	9.9			21.1			20.1	19.2
Level of Service	F	B		C	A			C			C	B
Approach Delay (s)		14.1			10.6			21.1			19.6	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay			14.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			44.0			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			41.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: California Ave & Haley Street























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	263	61	33	280	7	67	65	67	9	45	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4941		1770	5067		1770	1863	1583	1770	1794	
Flt Permitted	0.95	1.00		0.95	1.00		0.71	1.00	1.00	0.71	1.00	
Satd. Flow (perm)	1770	4941		1770	5067		1326	1863	1583	1314	1794	
Peak-hour factor, PHF	0.96	0.96	0.96	0.77	0.77	0.77	0.82	0.82	0.82	0.86	0.86	0.86
Adj. Flow (vph)	23	274	64	43	364	9	82	79	82	10	52	17
RTOR Reduction (vph)	0	33	0	0	2	0	0	0	67	0	11	0
Lane Group Flow (vph)	23	305	0	43	371	0	82	79	15	10	58	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	0.7	11.0		0.8	11.1		5.9	5.9	5.9	5.9	5.9	
Effective Green, g (s)	0.7	11.0		0.8	11.1		5.9	5.9	5.9	5.9	5.9	
Actuated g/C Ratio	0.02	0.35		0.03	0.35		0.19	0.19	0.19	0.19	0.19	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	40	1736		45	1797		250	351	298	248	338	
v/s Ratio Prot	0.01	0.06		c0.02	c0.07			0.04			0.03	
v/s Ratio Perm							c0.06		0.01	0.01		
v/c Ratio	0.57	0.18		0.96	0.21		0.33	0.23	0.05	0.04	0.17	
Uniform Delay, d1	15.2	7.0		15.2	7.0		11.0	10.8	10.4	10.4	10.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.8	0.0		115.5	0.0		0.3	0.1	0.0	0.0	0.1	
Delay (s)	27.0	7.0		130.7	7.1		11.3	10.9	10.4	10.4	10.7	
Level of Service	C	A		F	A		B	B	B	B	B	
Approach Delay (s)		8.3			19.8			10.9			10.7	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			31.3			Sum of lost time (s)			8.6			
Intersection Capacity Utilization			33.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: California Ave & Haley Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	420	55	56	425	17	70	84	71	7	59	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4997		1770	5055		1770	1863	1583	1770	1816	
Flt Permitted	0.95	1.00		0.95	1.00		0.70	1.00	1.00	0.70	1.00	
Satd. Flow (perm)	1770	4997		1770	5055		1295	1863	1583	1300	1816	
Peak-hour factor, PHF	0.96	0.96	0.96	0.64	0.64	0.64	0.92	0.92	0.92	0.75	0.75	0.75
Adj. Flow (vph)	16	438	57	88	664	27	76	91	77	9	79	16
RTOR Reduction (vph)	0	14	0	0	3	0	0	0	64	0	7	0
Lane Group Flow (vph)	16	481	0	88	688	0	76	91	13	9	88	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	0.7	13.1		3.2	15.6		6.0	6.0	6.0	6.0	6.0	
Effective Green, g (s)	0.7	13.1		3.2	15.6		6.0	6.0	6.0	6.0	6.0	
Actuated g/C Ratio	0.02	0.36		0.09	0.43		0.17	0.17	0.17	0.17	0.17	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	35	1823		158	2197		216	311	265	217	304	
v/s Ratio Prot	0.01	0.10		c0.05	c0.14			0.05			0.05	
v/s Ratio Perm							c0.06		0.01	0.01		
v/c Ratio	0.46	0.26		0.56	0.31		0.35	0.29	0.05	0.04	0.29	
Uniform Delay, d1	17.4	8.0		15.7	6.6		13.2	13.1	12.6	12.5	13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	0.0		2.4	0.0		0.4	0.2	0.0	0.0	0.2	
Delay (s)	20.8	8.0		18.1	6.7		13.6	13.3	12.6	12.6	13.3	
Level of Service	C	A		B	A		B	B	B	B	B	
Approach Delay (s)		8.4			8.0			13.2			13.2	
Approach LOS		A			A			B			B	





















Intersection Summary

HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	35.9	Sum of lost time (s)	8.6
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: California Ave & MT Vernon Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	68	57	40	80	79	97	683	29	72	593	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	16	12	12
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.93		1.00	0.93		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3298		3433	3275		3433	3518		3891	3388	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3298		3433	3275		3433	3518		3891	3388	
Peak-hour factor, PHF	0.86	0.86	0.86	0.95	0.95	0.95	0.87	0.87	0.87	0.93	0.93	0.93
Adj. Flow (vph)	208	79	66	42	84	83	111	785	33	77	638	255
RTOR Reduction (vph)	0	50	0	0	69	0	0	2	0	0	29	0
Lane Group Flow (vph)	208	95	0	42	98	0	111	816	0	77	864	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.6	16.9		3.5	11.8		5.5	24.9		4.7	24.1	
Effective Green, g (s)	8.6	16.9		3.5	11.8		5.5	24.9		4.7	24.1	
Actuated g/C Ratio	0.12	0.24		0.05	0.17		0.08	0.35		0.07	0.34	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	420	793		171	550		269	1246		260	1161	
v/s Ratio Prot	c0.06	0.03		0.01	c0.03		c0.03	0.23		0.02	c0.26	
v/s Ratio Perm												
v/c Ratio	0.50	0.12		0.25	0.18		0.41	0.65		0.30	0.74	
Uniform Delay, d1	28.8	20.9		32.1	25.1		30.9	19.1		31.2	20.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.3	0.1		0.4	1.0		0.2	2.3	
Delay (s)	29.2	20.9		32.4	25.1		31.2	20.0		31.5	22.7	
Level of Service	C	C		C	C		C	C		C	C	
Approach Delay (s)		25.8			26.6			21.4			23.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			23.2			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			70.3			Sum of lost time (s)			20.3			
Intersection Capacity Utilization			57.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: California Ave & MT Vernon Ave













5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	146	134	51	79	87	132	732	31	116	754	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	16	12	12
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.93		1.00	0.92		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3285		3433	3261		3433	3518		3891	3373	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3285		3433	3261		3433	3518		3891	3373	
Peak-hour factor, PHF	0.85	0.85	0.85	0.82	0.82	0.82	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	424	172	158	62	96	106	148	822	35	126	820	373
RTOR Reduction (vph)	0	118	0	0	91	0	0	2	0	0	38	0
Lane Group Flow (vph)	424	212	0	62	111	0	148	855	0	126	1155	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.7	19.5		5.1	10.9		7.8	24.8		7.0	24.0	
Effective Green, g (s)	13.7	19.5		5.1	10.9		7.8	24.8		7.0	24.0	
Actuated g/C Ratio	0.18	0.25		0.07	0.14		0.10	0.32		0.09	0.31	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	613	835		228	463		349	1138		355	1055	
v/s Ratio Prot	c0.12	c0.06		0.02	0.03		c0.04	0.24		0.03	c0.34	
v/s Ratio Perm												
v/c Ratio	0.69	0.25		0.27	0.24		0.42	0.75		0.35	1.09	
Uniform Delay, d1	29.5	22.8		34.0	29.2		32.3	23.2		32.7	26.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.1		0.2	0.1		0.3	2.5		0.2	57.4	
Delay (s)	32.2	22.9		34.3	29.3		32.6	25.7		33.0	83.7	
Level of Service	C	C		C	C		C	C		C	F	
Approach Delay (s)		28.1			30.5			26.7			78.9	
Approach LOS		C			C			C			E	
Intersection Summary												
HCM Average Control Delay			47.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			76.7			Sum of lost time (s)			14.3			
Intersection Capacity Utilization			71.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: 14TH Street & Q Street













5/24/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	2	357	177	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Peak-hour factor, PHF	0.25	0.25	0.72	0.72	0.74	0.74
Adj. Flow (vph)	4	4	3	496	239	5
RTOR Reduction (vph)	0	4	0	0	0	3
Lane Group Flow (vph)	4	0	3	496	239	2
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	0.5	0.5	0.5	15.4	10.9	10.9
Effective Green, g (s)	0.5	0.5	0.5	15.4	10.9	10.9
Actuated g/C Ratio	0.02	0.02	0.02	0.63	0.44	0.44
Clearance Time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	36	32	36	2225	1574	704
v/s Ratio Prot	c0.00		0.00	c0.14	0.07	
v/s Ratio Perm		0.00				0.00
v/c Ratio	0.11	0.00	0.08	0.22	0.15	0.00
Uniform Delay, d1	11.8	11.8	11.8	2.0	4.0	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.0	0.4	0.0	0.0	0.0
Delay (s)	12.3	11.8	12.1	2.0	4.1	3.8
Level of Service	B	B	B	A	A	A
Approach Delay (s)	12.0			2.0	4.1	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			2.8		HCM Level of Service	A
HCM Volume to Capacity ratio			0.22			
Actuated Cycle Length (s)			24.5		Sum of lost time (s)	8.6
Intersection Capacity Utilization			20.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

28: 14TH Street & Q Street























5/24/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	20	9	18	455	395	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Peak-hour factor, PHF	0.60	0.60	0.86	0.86	0.81	0.81
Adj. Flow (vph)	33	15	21	529	488	28
RTOR Reduction (vph)	0	14	0	0	0	9
Lane Group Flow (vph)	33	1	21	529	488	19
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	1.4	1.4	0.6	16.1	11.5	11.5
Effective Green, g (s)	1.4	1.4	0.6	16.1	11.5	11.5
Actuated g/C Ratio	0.05	0.05	0.02	0.62	0.44	0.44
Clearance Time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	95	85	41	2183	1559	697
v/s Ratio Prot	c0.02		0.01	c0.15	c0.14	
v/s Ratio Perm		0.00				0.01
v/c Ratio	0.35	0.01	0.51	0.24	0.31	0.03
Uniform Delay, d1	11.9	11.7	12.6	2.3	4.7	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.0	4.4	0.0	0.0	0.0
Delay (s)	12.7	11.7	17.0	2.3	4.8	4.1
Level of Service	B	B	B	A	A	A
Approach Delay (s)	12.4			2.8	4.7	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			4.1	HCM Level of Service		A
HCM Volume to Capacity ratio			0.36			
Actuated Cycle Length (s)			26.1	Sum of lost time (s)		13.2
Intersection Capacity Utilization			25.5%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

29: Hayden Ct & Union Ave























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	0	12	133	0	18	96	1320	104	154	896	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1794		1681	1905	1583	1770	5030		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1794		1681	1905	1583	1770	5030		1770	5085	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.67	0.67	0.67	0.76	0.76	0.76	0.73	0.73	0.73
Adj. Flow (vph)	232	0	48	199	0	27	126	1737	137	211	1227	190
RTOR Reduction (vph)	0	39	0	0	0	23	0	7	0	0	0	57
Lane Group Flow (vph)	232	9	0	99	100	4	126	1867	0	211	1227	133
Turn Type	Split			Split		Perm	Prot			Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	18.5	18.5		13.6	13.6	13.6	11.2	30.5		15.3	34.6	34.6
Effective Green, g (s)	18.5	18.5		13.6	13.6	13.6	11.2	30.5		15.3	34.6	34.6
Actuated g/C Ratio	0.20	0.20		0.14	0.14	0.14	0.12	0.32		0.16	0.37	0.37
Clearance Time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	5.5	5.5		5.5	5.5	5.5	2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	347	352		242	274	228	210	1625		287	1864	580
v/s Ratio Prot	c0.13	0.01		c0.06	0.05		0.07	c0.37		c0.12	0.24	
v/s Ratio Perm						0.00						0.08
v/c Ratio	0.67	0.03		0.41	0.36	0.02	0.60	1.15		0.74	0.66	0.23
Uniform Delay, d1	35.1	30.7		36.7	36.5	34.7	39.5	32.0		37.6	25.0	20.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.9	0.1		2.8	2.0	0.1	3.1	74.6		8.1	1.2	0.5
Delay (s)	42.0	30.7		39.5	38.5	34.7	42.5	106.5		45.8	26.2	21.1
Level of Service	D	C		D	D	C	D	F		D	C	C
Approach Delay (s)		40.1			38.5			102.5			28.1	
Approach LOS		D			D			F			C	
Intersection Summary												
HCM Average Control Delay			65.5			HCM Level of Service			E			
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			94.4			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			57.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Hayden Ct & Union Ave

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	7	53	225	7	104	80	1209	10	35	1357	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1832		1681	1916	1583	1770	5079		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1832		1681	1916	1583	1770	5079		1770	5085	1583
Peak-hour factor, PHF	0.79	0.79	0.79	0.81	0.81	0.81	0.97	0.97	0.97	0.83	0.83	0.83
Adj. Flow (vph)	195	9	67	278	9	128	82	1246	10	42	1635	81
RTOR Reduction (vph)	0	54	0	0	0	104	0	1	0	0	0	19
Lane Group Flow (vph)	195	22	0	145	142	24	82	1255	0	42	1635	62
Turn Type	Split			Split		Perm	Prot			Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	17.0	17.0		16.8	16.8	16.8	7.3	34.8		4.3	31.8	31.8
Effective Green, g (s)	17.0	17.0		16.8	16.8	16.8	7.3	34.8		4.3	31.8	31.8
Actuated g/C Ratio	0.19	0.19		0.19	0.19	0.19	0.08	0.39		0.05	0.36	0.36
Clearance Time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	5.5	5.5		5.5	5.5	5.5	2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	337	348		316	360	297	145	1977		85	1809	563
v/s Ratio Prot	c0.11	0.01		c0.09	0.07		c0.05	c0.25		0.02	c0.32	
v/s Ratio Perm						0.02						0.04
v/c Ratio	0.58	0.06		0.46	0.39	0.08	0.57	0.63		0.49	0.90	0.11
Uniform Delay, d1	32.9	29.7		32.3	31.8	29.9	39.5	22.1		41.5	27.3	19.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.3	0.2		2.6	1.7	0.3	3.0	1.0		1.6	7.3	0.2
Delay (s)	37.2	29.9		34.8	33.6	30.2	42.5	23.1		43.1	34.6	19.5
Level of Service	D	C		C	C	C	D	C		D	C	B
Approach Delay (s)		35.2			33.0			24.3			34.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			30.6				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			89.4				Sum of lost time (s)		21.4			
Intersection Capacity Utilization			57.2%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: Truxtun Ave & Oak St

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1087	1042	135	133	395	47	401	624	420	107	263	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.77	0.77	0.77	0.70	0.70	0.70	0.65	0.65	0.65	0.73	0.73	0.73
Adj. Flow (vph)	1412	1353	175	190	564	67	617	960	646	147	360	567
RTOR Reduction (vph)	0	0	48	0	0	54	0	0	170	0	0	267
Lane Group Flow (vph)	1412	1353	127	190	564	13	617	960	476	147	360	300
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	34.2	49.2	49.2	9.5	24.5	24.5	16.0	34.8	34.8	10.7	29.5	29.5
Effective Green, g (s)	34.2	49.2	49.2	9.5	24.5	24.5	16.0	34.8	34.8	10.7	29.5	29.5
Actuated g/C Ratio	0.28	0.40	0.40	0.08	0.20	0.20	0.13	0.28	0.28	0.09	0.24	0.24
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Vehicle Extension (s)	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Lane Grp Cap (vph)	959	1423	636	266	708	317	449	1006	450	300	853	382
v/s Ratio Prot	c0.41	c0.38		0.06	0.16		c0.18	0.27		0.04	0.10	
v/s Ratio Perm			0.08			0.01			c0.30			c0.19
v/c Ratio	1.47	0.95	0.20	0.71	0.80	0.04	1.37	0.95	1.06	0.49	0.42	0.78
Uniform Delay, d1	44.1	35.4	23.8	55.1	46.6	39.5	53.2	43.0	43.8	53.2	39.2	43.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	218.3	13.7	0.1	7.4	5.8	0.0	182.0	18.1	58.8	0.5	0.1	9.4
Delay (s)	262.4	49.2	23.8	62.5	52.4	39.5	235.2	61.1	102.6	53.7	39.4	52.9
Level of Service	F	D	C	E	D	D	F	E	F	D	D	D
Approach Delay (s)		150.0			53.7			121.5			48.5	
Approach LOS		F			D			F			D	
Intersection Summary												
HCM Average Control Delay			114.4				HCM Level of Service		F			
HCM Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			122.4				Sum of lost time (s)		12.9			
Intersection Capacity Utilization			79.3%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: Truxtun Ave & Oak St






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	689	670	331	447	1047	80	283	603	224	51	706	545
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.88	0.88	0.88	0.87	0.87	0.87
Adj. Flow (vph)	766	744	368	486	1138	87	322	685	255	59	811	626
RTOR Reduction (vph)	0	0	226	0	0	47	0	0	187	0	0	228
Lane Group Flow (vph)	766	744	142	486	1138	40	322	685	68	59	811	398
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	26.1	34.4	34.4	26.8	35.1	35.1	14.0	34.3	34.3	14.0	34.3	34.3
Effective Green, g (s)	26.1	34.4	34.4	26.8	35.1	35.1	14.0	34.3	34.3	14.0	34.3	34.3
Actuated g/C Ratio	0.20	0.27	0.27	0.21	0.27	0.27	0.11	0.27	0.27	0.11	0.27	0.27
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Vehicle Extension (s)	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Lane Grp Cap (vph)	702	953	426	720	973	435	376	951	425	376	951	425
v/s Ratio Prot	c0.22	0.21		0.14	c0.32		c0.09	0.19		0.02	0.23	
v/s Ratio Perm			0.09			0.03			0.04			c0.25
v/c Ratio	1.09	0.78	0.33	0.68	1.17	0.09	0.86	0.72	0.16	0.16	0.85	0.94
Uniform Delay, d1	50.8	43.2	37.5	46.4	46.3	34.4	55.9	42.3	35.7	51.5	44.3	45.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	61.5	3.9	0.2	2.0	87.4	0.0	16.6	2.3	0.1	0.1	7.2	27.6
Delay (s)	112.3	47.0	37.6	48.4	133.7	34.5	72.4	44.6	35.8	51.6	51.5	73.3
Level of Service	F	D	D	D	F	C	E	D	D	D	D	E
Approach Delay (s)		71.8			104.5			49.9			60.6	
Approach LOS		E			F			D			E	
Intersection Summary												
HCM Average Control Delay			73.6			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			127.7			Sum of lost time (s)			18.2			
Intersection Capacity Utilization			91.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: Truxton St & F Street






















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1225	7	11	467	47	16	34	1	83	77	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3536		1770	3491		1770	1857		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3536		1770	3491		1770	1857		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.76	0.76	0.76	0.71	0.71	0.71	0.85	0.85	0.85
Adj. Flow (vph)	106	1361	8	14	614	62	23	48	1	98	91	76
RTOR Reduction (vph)	0	0	0	0	8	0	0	1	0	0	0	64
Lane Group Flow (vph)	106	1369	0	14	668	0	23	48	0	98	91	12
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	5.5	31.3		0.7	26.5		0.8	4.7		5.6	9.5	9.5
Effective Green, g (s)	5.5	31.3		0.7	26.5		0.8	4.7		5.6	9.5	9.5
Actuated g/C Ratio	0.09	0.54		0.01	0.45		0.01	0.08		0.10	0.16	0.16
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	166	1892		21	1581		24	149		169	303	257
v/s Ratio Prot	c0.06	c0.39		0.01	0.19		0.01	0.03		c0.06	c0.05	
v/s Ratio Perm												0.01
v/c Ratio	0.64	0.72		0.67	0.42		0.96	0.32		0.58	0.30	0.05
Uniform Delay, d1	25.5	10.3		28.8	10.8		28.8	25.4		25.3	21.6	20.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	1.2		47.8	0.1		162.4	0.5		3.0	0.2	0.0
Delay (s)	31.3	11.5		76.6	10.9		191.3	25.9		28.3	21.8	20.7
Level of Service	C	B		E	B		F	C		C	C	C
Approach Delay (s)		12.9			12.2			78.7			23.9	
Approach LOS		B			B			E			C	
Intersection Summary												
HCM Average Control Delay			15.8			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			58.5			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			58.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: Truxtun St & F Street





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	673	18	37	977	62	79	94	10	182	64	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3525		1770	3507		1770	1835		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3525		1770	3507		1770	1835		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.80	0.80	0.80	0.74	0.74	0.74	0.81	0.81	0.81
Adj. Flow (vph)	108	748	20	46	1221	78	107	127	14	225	79	121
RTOR Reduction (vph)	0	2	0	0	5	0	0	4	0	0	0	96
Lane Group Flow (vph)	108	766	0	46	1294	0	107	137	0	225	79	25
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.7	36.7		3.7	33.7		6.6	11.5		11.4	16.3	16.3
Effective Green, g (s)	6.7	36.7		3.7	33.7		6.6	11.5		11.4	16.3	16.3
Actuated g/C Ratio	0.08	0.46		0.05	0.42		0.08	0.14		0.14	0.21	0.21
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	149	1627		82	1487		147	265		254	382	325
v/s Ratio Prot	c0.06	c0.22		0.03	c0.37		0.06	c0.07		c0.13	0.04	
v/s Ratio Perm												0.02
v/c Ratio	0.72	0.47		0.56	0.87		0.73	0.52		0.89	0.21	0.08
Uniform Delay, d1	35.5	14.7		37.1	20.9		35.6	31.4		33.4	26.2	25.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.7	0.1		5.1	5.7		14.1	0.7		27.9	0.1	0.0
Delay (s)	49.2	14.8		42.2	26.6		49.7	32.1		61.3	26.3	25.6
Level of Service	D	B		D	C		D	C		E	C	C
Approach Delay (s)		19.0			27.1			39.7			44.6	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay			28.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			79.5			Sum of lost time (s)			20.4			
Intersection Capacity Utilization			61.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: Truxton St & H St





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1116	106	67	387	22	112	414	94	19	202	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3493		1770	3510		1770	3441		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3493		1770	3510		1770	3441		1770	3487	
Peak-hour factor, PHF	0.91	0.91	0.91	0.77	0.77	0.77	0.80	0.80	0.80	0.71	0.71	0.71
Adj. Flow (vph)	104	1226	116	87	503	29	140	518	118	27	285	31
RTOR Reduction (vph)	0	4	0	0	2	0	0	13	0	0	6	0
Lane Group Flow (vph)	104	1338	0	87	530	0	140	623	0	27	310	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.0	47.7		6.9	45.6		11.0	24.4		4.3	17.7	
Effective Green, g (s)	9.0	47.7		6.9	45.6		11.0	24.4		4.3	17.7	
Actuated g/C Ratio	0.09	0.49		0.07	0.47		0.11	0.25		0.04	0.18	
Clearance Time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Vehicle Extension (s)	0.5	2.0		0.5	2.0		0.5	2.0		0.5	2.0	
Lane Grp Cap (vph)	163	1707		125	1640		199	860		78	632	
v/s Ratio Prot	c0.06	c0.38		0.05	0.15		c0.08	c0.18		0.02	0.09	
v/s Ratio Perm												
v/c Ratio	0.64	0.78		0.70	0.32		0.70	0.72		0.35	0.49	
Uniform Delay, d1	42.7	20.7		44.3	16.3		41.7	33.5		45.3	35.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.9	2.2		12.7	0.0		8.9	2.6		1.0	0.2	
Delay (s)	48.6	22.9		57.1	16.4		50.6	36.1		46.3	36.1	
Level of Service	D	C		E	B		D	D		D	D	
Approach Delay (s)		24.8			22.1			38.7			36.9	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay			29.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			97.6			Sum of lost time (s)			6.4			
Intersection Capacity Utilization			72.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

























HCM Signalized Intersection Capacity Analysis

32: Truxtun St & H St

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	804	14	45	949	15	64	291	9	33	475	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3530		1770	3531		1770	3524		1770	3488	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3530		1770	3531		1770	3524		1770	3488	
Peak-hour factor, PHF	0.88	0.88	0.88	0.81	0.81	0.81	0.79	0.79	0.79	0.78	0.78	0.78
Adj. Flow (vph)	57	914	16	56	1172	19	81	368	11	42	609	65
RTOR Reduction (vph)	0	1	0	0	1	0	0	1	0	0	5	0
Lane Group Flow (vph)	57	929	0	56	1190	0	81	378	0	42	669	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	5.5	48.0		5.4	47.9		6.7	27.0		4.5	24.8	
Effective Green, g (s)	5.5	48.0		5.4	47.9		6.7	27.0		4.5	24.8	
Actuated g/C Ratio	0.06	0.48		0.05	0.48		0.07	0.27		0.05	0.25	
Clearance Time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Vehicle Extension (s)	0.5	2.0		0.5	2.0		0.5	2.0		0.5	2.0	
Lane Grp Cap (vph)	98	1708		96	1705		120	959		80	872	
v/s Ratio Prot	c0.03	0.26		0.03	c0.34		c0.05	0.11		0.02	c0.19	
v/s Ratio Perm												
v/c Ratio	0.58	0.54		0.58	0.70		0.68	0.39		0.53	0.77	
Uniform Delay, d1	45.7	17.9		45.8	20.0		45.2	29.4		46.3	34.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	0.2		5.7	1.0		11.2	0.1		2.8	3.7	
Delay (s)	51.3	18.1		51.5	21.0		56.4	29.5		49.2	38.2	
Level of Service	D	B		D	C		E	C		D	D	
Approach Delay (s)		20.0			22.4			34.3			38.8	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			26.8			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			99.2			Sum of lost time (s)			14.3			
Intersection Capacity Utilization			62.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												































5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	805	65	96	438	52	108	570	262	127	233	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.79	0.79	0.79	0.95	0.95	0.95
Adj. Flow (vph)	139	970	78	107	487	58	137	722	332	134	245	124
RTOR Reduction (vph)	0	0	18	0	0	42	0	0	160	0	0	101
Lane Group Flow (vph)	139	970	60	107	487	16	137	722	172	134	245	23
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.8	26.4	26.4	10.5	25.1	25.1	26.6	27.0	27.0	11.6	12.0	12.0
Effective Green, g (s)	11.8	26.4	26.4	10.5	25.1	25.1	26.6	27.0	27.0	11.6	12.0	12.0
Actuated g/C Ratio	0.13	0.29	0.29	0.11	0.27	0.27	0.29	0.30	0.30	0.13	0.13	0.13
Clearance Time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	229	1469	457	203	972	435	515	1045	468	225	465	208
v/s Ratio Prot	c0.08	c0.19		0.06	0.14		0.08	c0.20		c0.08	0.07	
v/s Ratio Perm			0.04			0.01			0.11			0.01
v/c Ratio	0.61	0.66	0.13	0.53	0.50	0.04	0.27	0.69	0.37	0.60	0.53	0.11
Uniform Delay, d1	37.6	28.6	24.0	38.1	27.9	24.3	24.9	28.5	25.5	37.7	37.1	35.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	0.9	0.0	1.1	0.1	0.0	0.1	1.6	0.2	2.8	0.5	0.1
Delay (s)	40.7	29.4	24.1	39.3	28.0	24.3	25.0	30.1	25.6	40.5	37.5	35.1
Level of Service	D	C	C	D	C	C	C	C	C	D	D	D
Approach Delay (s)		30.4			29.5			28.3			37.7	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			30.6		HCM Level of Service					C		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			91.4		Sum of lost time (s)					11.5		
Intersection Capacity Utilization			57.8%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Truxtun St & Chester Ave






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			  	
Volume (vph)	120	566	75	189	826	105	73	464	86	61	518	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.91	0.91	0.91	0.86	0.86	0.86	0.91	0.91	0.91
Adj. Flow (vph)	125	590	78	208	908	115	85	540	100	67	569	160
RTOR Reduction (vph)	0	0	29	0	0	58	0	0	68	0	0	48
Lane Group Flow (vph)	125	590	49	208	908	57	85	540	32	67	569	112
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.2	27.3	27.3	16.1	32.2	32.2	7.5	23.7	23.7	6.2	22.4	22.4
Effective Green, g (s)	11.2	27.3	27.3	16.1	32.2	32.2	7.5	23.7	23.7	6.2	22.4	22.4
Actuated g/C Ratio	0.13	0.31	0.31	0.18	0.36	0.36	0.08	0.27	0.27	0.07	0.25	0.25
Clearance Time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	222	1556	484	319	1278	571	149	940	421	123	889	398
v/s Ratio Prot	0.07	0.12		c0.12	c0.26		0.05	c0.15		0.04	c0.16	
v/s Ratio Perm			0.03			0.04			0.02			0.07
v/c Ratio	0.56	0.38	0.10	0.65	0.71	0.10	0.57	0.57	0.08	0.54	0.64	0.28
Uniform Delay, d1	36.7	24.3	22.2	33.9	24.5	18.9	39.3	28.4	24.6	40.1	29.8	26.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.1	0.0	3.6	1.6	0.0	3.3	0.5	0.0	2.6	1.2	0.1
Delay (s)	38.6	24.4	22.2	37.6	26.1	18.9	42.6	28.9	24.6	42.8	31.0	27.1
Level of Service	D	C	C	D	C	B	D	C	C	D	C	C
Approach Delay (s)		26.4			27.3			29.9			31.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay	28.5			HCM Level of Service						C		
HCM Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	89.2			Sum of lost time (s)						7.5		
Intersection Capacity Utilization	61.5%			ICU Level of Service						B		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Truxtun St & L Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	553	452	139	418	17	39	29	39	24	235	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4742		1770	5055		1770	1863	1583	1770	1822	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4742		1770	5055		1770	1863	1583	1770	1822	
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72	0.78	0.78	0.78	0.67	0.67	0.67
Adj. Flow (vph)	265	768	628	193	581	24	50	37	50	36	351	60
RTOR Reduction (vph)	0	91	0	0	3	0	0	0	34	0	4	0
Lane Group Flow (vph)	265	1305	0	193	602	0	50	37	16	36	407	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	36.1	39.1		16.3	19.3		6.5	34.1	34.1	3.8	31.4	
Effective Green, g (s)	36.1	39.1		16.3	19.3		6.5	34.1	34.1	3.8	31.4	
Actuated g/C Ratio	0.33	0.36		0.15	0.18		0.06	0.31	0.31	0.03	0.29	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	581	1687		263	888		105	578	491	61	521	
v/s Ratio Prot	0.15	c0.28		0.11	c0.12		c0.03	0.02		0.02	c0.22	
v/s Ratio Perm									0.01			
v/c Ratio	0.46	0.95dr		0.73	0.68		0.48	0.06	0.03	0.59	0.78	
Uniform Delay, d1	29.1	31.5		44.7	42.4		50.1	26.7	26.4	52.3	36.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	2.1		8.8	1.6		1.2	0.0	0.0	9.8	6.9	
Delay (s)	29.4	33.5		53.5	44.0		51.3	26.7	26.4	62.0	43.0	
Level of Service	C	C		D	D		D	C	C	E	D	
Approach Delay (s)		32.9			46.3			35.6			44.6	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	38.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	109.9	Sum of lost time (s)	17.2
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		























dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

34: Truxtun St & L Street




























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	153	529	41	23	709	28	184	197	60	48	75	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5030		1770	5057		1770	1863	1583	1770	1656	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5030		1770	5057		1770	1863	1583	1770	1656	
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.68	0.68	0.68	0.94	0.94	0.94
Adj. Flow (vph)	159	551	43	25	771	30	271	290	88	51	80	226
RTOR Reduction (vph)	0	5	0	0	3	0	0	0	56	0	72	0
Lane Group Flow (vph)	159	589	0	25	798	0	271	290	32	51	234	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	15.0	34.1		3.1	22.2		21.5	34.1	34.1	5.5	18.1	
Effective Green, g (s)	15.0	34.1		3.1	22.2		21.5	34.1	34.1	5.5	18.1	
Actuated g/C Ratio	0.16	0.37		0.03	0.24		0.23	0.37	0.37	0.06	0.19	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	284	1836		59	1202		407	680	578	104	321	
v/s Ratio Prot	c0.09	0.12		0.01	c0.16		c0.15	0.16		0.03	c0.14	
v/s Ratio Perm									0.02			
v/c Ratio	0.56	0.32		0.42	0.66		0.67	0.43	0.06	0.49	0.73	
Uniform Delay, d1	36.2	21.3		44.3	32.2		32.7	22.3	19.2	42.6	35.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	0.0		1.8	1.1		3.2	0.2	0.0	1.3	6.9	
Delay (s)	37.5	21.4		46.1	33.3		35.9	22.5	19.2	43.9	42.2	
Level of Service	D	C		D	C		D	C	B	D	D	
Approach Delay (s)		24.8			33.7			27.6			42.5	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			30.8			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			93.4			Sum of lost time (s)			16.6			
Intersection Capacity Utilization			63.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Truxtun St & N Street
























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Volume (vph)	113	433	66	45	556	9	21	38	33	23	36	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5074		1770	1863	1583	1770	1778	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5074		1770	1863	1583	1770	1778	
Peak-hour factor, PHF	0.76	0.76	0.76	0.72	0.72	0.72	0.64	0.64	0.64	0.63	0.63	0.63
Adj. Flow (vph)	149	570	87	62	772	12	33	59	52	37	57	25
RTOR Reduction (vph)	0	0	43	0	1	0	0	0	47	0	13	0
Lane Group Flow (vph)	149	570	44	62	783	0	33	59	5	37	69	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	9.4	20.7	20.7	6.9	18.2		1.8	5.3	5.3	1.9	5.4	
Effective Green, g (s)	9.4	20.7	20.7	6.9	18.2		1.8	5.3	5.3	1.9	5.4	
Actuated g/C Ratio	0.18	0.40	0.40	0.13	0.35		0.03	0.10	0.10	0.04	0.10	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	321	2028	631	235	1779		61	190	162	65	185	
v/s Ratio Prot	c0.08	0.11		0.04	c0.15		0.02	0.03		c0.02	c0.04	
v/s Ratio Perm			0.03						0.00			
v/c Ratio	0.46	0.28	0.07	0.26	0.44		0.54	0.31	0.03	0.57	0.38	
Uniform Delay, d1	19.0	10.6	9.6	20.2	12.9		24.6	21.6	21.0	24.6	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.0	0.0	0.2	0.1		5.2	0.3	0.0	6.7	0.5	
Delay (s)	19.4	10.6	9.7	20.4	13.0		29.8	21.9	21.0	31.2	22.1	
Level of Service	B	B	A	C	B		C	C	C	C	C	
Approach Delay (s)		12.1			13.5			23.4			25.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			14.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			51.9			Sum of lost time (s)			12.6			
Intersection Capacity Utilization			36.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Truxtun St & N Street



























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	533	30	16	660	14	43	30	39	17	16	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5069		1770	1863	1583	1770	1678	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5069		1770	1863	1583	1770	1678	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	65	567	32	17	702	15	60	42	54	22	21	41
RTOR Reduction (vph)	0	0	16	0	1	0	0	0	45	0	36	0
Lane Group Flow (vph)	65	567	16	17	716	0	60	42	9	22	26	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	3.1	18.2	18.2	1.4	16.5		3.0	7.6	7.6	0.8	5.4	
Effective Green, g (s)	3.1	18.2	18.2	1.4	16.5		3.0	7.6	7.6	0.8	5.4	
Actuated g/C Ratio	0.07	0.40	0.40	0.03	0.37		0.07	0.17	0.17	0.02	0.12	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	122	2052	639	55	1855		118	314	267	31	201	
v/s Ratio Prot	c0.04	0.11		0.01	c0.14		c0.03	c0.02		0.01	0.02	
v/s Ratio Perm			0.01						0.01			
v/c Ratio	0.53	0.28	0.03	0.31	0.39		0.51	0.13	0.03	0.71	0.13	
Uniform Delay, d1	20.3	9.0	8.1	21.4	10.6		20.3	15.9	15.7	22.0	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.0	0.0	1.2	0.0		1.3	0.1	0.0	46.1	0.1	
Delay (s)	22.5	9.1	8.1	22.5	10.6		21.6	16.0	15.7	68.2	17.9	
Level of Service	C	A	A	C	B		C	B	B	E	B	
Approach Delay (s)		10.3			10.9			18.1			31.0	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay			12.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			45.1			Sum of lost time (s)			12.6			
Intersection Capacity Utilization			36.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Truxtun St & Q Street



























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Volume (vph)	98	344	83	67	497	15	64	195	118	16	127	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4936		1770	5063		1770	1863	1583	1770	1794	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4936		1770	5063		1770	1863	1583	1770	1794	
Peak-hour factor, PHF	0.86	0.86	0.86	0.78	0.78	0.78	0.70	0.70	0.70	0.80	0.80	0.80
Adj. Flow (vph)	114	400	97	86	637	19	91	279	169	20	159	52
RTOR Reduction (vph)	0	28	0	0	2	0	0	0	115	0	7	0
Lane Group Flow (vph)	114	469	0	86	654	0	91	279	54	20	204	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	6.8	16.6		5.8	15.6		6.0	19.8	19.8	1.7	15.5	
Effective Green, g (s)	6.8	16.6		5.8	15.6		6.0	19.8	19.8	1.7	15.5	
Actuated g/C Ratio	0.11	0.27		0.09	0.25		0.10	0.32	0.32	0.03	0.25	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)	196	1334		167	1286		173	601	510	49	453	
v/s Ratio Prot	c0.06	0.09		0.05	c0.13		c0.05	c0.15		0.01	0.11	
v/s Ratio Perm									0.03			
v/c Ratio	0.58	0.35		0.51	0.51		0.53	0.46	0.11	0.41	0.45	
Uniform Delay, d1	25.9	18.1		26.5	19.6		26.3	16.6	14.6	29.4	19.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.8	0.1		1.1	0.1		1.3	0.2	0.0	2.0	0.3	
Delay (s)	28.8	18.1		27.6	19.7		27.7	16.8	14.6	31.4	19.6	
Level of Service	C	B		C	B		C	B	B	C	B	
Approach Delay (s)		20.1			20.6			17.9			20.6	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			19.8			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			61.4			Sum of lost time (s)			12.9			
Intersection Capacity Utilization			43.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis













36: Truxtun St & Q Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Volume (vph)	91	557	55	103	460	36	39	162	112	44	185	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5017		1770	5030		1770	1863	1583	1770	1817	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5017		1770	5030		1770	1863	1583	1770	1817	
Peak-hour factor, PHF	0.76	0.76	0.76	0.86	0.86	0.86	0.90	0.90	0.90	0.76	0.76	0.76
Adj. Flow (vph)	120	733	72	120	535	42	43	180	124	58	243	47
RTOR Reduction (vph)	0	8	0	0	7	0	0	0	94	0	4	0
Lane Group Flow (vph)	120	797	0	120	570	0	43	180	30	58	286	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.2	20.3		9.4	18.5		3.5	16.6	16.6	5.2	18.3	
Effective Green, g (s)	11.2	20.3		9.4	18.5		3.5	16.6	16.6	5.2	18.3	
Actuated g/C Ratio	0.16	0.29		0.14	0.27		0.05	0.24	0.24	0.08	0.27	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)	287	1476		241	1349		90	448	381	133	482	
v/s Ratio Prot	0.07	c0.16		c0.07	0.11		0.02	0.10		c0.03	c0.16	
v/s Ratio Perm									0.02			
v/c Ratio	0.42	0.54		0.50	0.42		0.48	0.40	0.08	0.44	0.59	
Uniform Delay, d1	26.0	20.4		27.6	20.8		31.9	22.0	20.3	30.5	22.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.6	0.1		1.5	0.2	0.0	0.8	1.3	
Delay (s)	26.3	20.7		28.2	20.9		33.3	22.2	20.3	31.3	23.4	
Level of Service	C	C		C	C		C	C	C	C	C	
Approach Delay (s)		21.4			22.2			22.9			24.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			22.4			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			69.0			Sum of lost time (s)			12.9			
Intersection Capacity Utilization			47.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 37: Truxtun Ave & E 19TH ST













5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑↑	↑	↑	↑↑		↑	↑↑	
Volume (vph)	0	287	124	131	390	35	180	69	0	16	45	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	5085	1583	1770	3539		1770	3483	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.70	1.00		0.70	1.00	
Satd. Flow (perm)		3539	1583	1770	5085	1583	1313	3539		1302	3483	
Peak-hour factor, PHF	0.79	0.79	0.79	0.76	0.76	0.76	0.81	0.81	0.81	0.66	0.66	0.66
Adj. Flow (vph)	0	363	157	172	513	46	222	85	0	24	68	8
RTOR Reduction (vph)	0	0	114	0	0	24	0	0	0	0	6	0
Lane Group Flow (vph)	0	363	43	172	513	22	222	85	0	24	70	0
Turn Type			Prot	Prot		Perm	Perm			Perm		
Protected Phases		2	2	1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)		11.1	11.1	4.0	19.1	19.1	11.2	11.2		11.2	11.2	
Effective Green, g (s)		11.1	11.1	4.0	19.1	19.1	11.2	11.2		11.2	11.2	
Actuated g/C Ratio		0.27	0.27	0.10	0.47	0.47	0.28	0.28		0.28	0.28	
Clearance Time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		2.0	2.0	1.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		970	434	175	2398	747	363	979		360	963	
v/s Ratio Prot		c0.10	0.03	c0.10	0.10			0.02			0.02	
v/s Ratio Perm						0.01	c0.17			0.02		
v/c Ratio		0.37	0.10	0.98	0.21	0.03	0.61	0.09		0.07	0.07	
Uniform Delay, d1		11.9	11.0	18.2	6.3	5.7	12.8	10.9		10.8	10.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0	62.5	0.0	0.0	2.1	0.0		0.0	0.0	
Delay (s)		12.0	11.0	80.7	6.3	5.7	14.9	10.9		10.8	10.8	
Level of Service		B	B	F	A	A	B	B		B	B	
Approach Delay (s)		11.7			23.8			13.8			10.8	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM Average Control Delay			17.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			40.5						14.2			
Intersection Capacity Utilization			44.1%						A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: Truxtun Ave & E 19TH ST




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑↑	↑	↑	↑↑		↑	↑↑	
Volume (vph)	0	563	274	166	385	38	83	70	0	31	105	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	5085	1583	1770	3539		1770	3539	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.66	1.00		0.71	1.00	
Satd. Flow (perm)		3539	1583	1770	5085	1583	1233	3539		1314	3539	
Peak-hour factor, PHF	0.73	0.73	0.73	0.96	0.96	0.96	0.93	0.93	0.93	0.74	0.74	0.74
Adj. Flow (vph)	0	771	375	173	401	40	89	75	0	42	142	C
RTOR Reduction (vph)	0	0	220	0	0	16	0	0	0	0	0	C
Lane Group Flow (vph)	0	771	155	173	401	24	89	75	0	42	142	C
Turn Type			Prot	Prot		Perm	Perm			Perm		
Protected Phases		2	2	1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)		17.6	17.6	4.4	26.0	26.0	6.5	6.5		6.5	6.5	
Effective Green, g (s)		17.6	17.6	4.4	26.0	26.0	6.5	6.5		6.5	6.5	
Actuated g/C Ratio		0.41	0.41	0.10	0.61	0.61	0.15	0.15		0.15	0.15	
Clearance Time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		2.0	2.0	1.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1459	652	182	3096	964	188	539		200	539	
v/s Ratio Prot		c0.22	0.10	c0.10	0.08			0.02			0.04	
v/s Ratio Perm						0.02	c0.07			0.03		
v/c Ratio		0.53	0.24	0.95	0.13	0.03	0.47	0.14		0.21	0.26	
Uniform Delay, d1		9.4	8.2	19.0	3.5	3.3	16.5	15.7		15.9	16.0	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.1	51.9	0.0	0.0	0.7	0.0		0.2	0.1	
Delay (s)		9.6	8.2	71.0	3.6	3.3	17.2	15.7		16.0	16.1	
Level of Service		A	A	E	A	A	B	B		B	B	
Approach Delay (s)		9.2			22.5			16.5			16.1	
Approach LOS		A			C			B			B	
Intersection Summary												
HCM Average Control Delay			14.2									
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			42.7									
Intersection Capacity Utilization			47.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 19th ST & Q Street




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	34	8	8	39	14	4	234	9	15	179	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.98			0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1812			1794		1770	1852		1770	1863	1583
Flt Permitted		0.97			0.95		0.62	1.00		0.57	1.00	1.00
Satd. Flow (perm)		1758			1721		1161	1852		1059	1863	1583
Peak-hour factor, PHF	0.78	0.78	0.78	0.76	0.76	0.76	0.77	0.77	0.77	0.83	0.83	0.83
Adj. Flow (vph)	6	44	10	11	51	18	5	304	12	18	216	11
RTOR Reduction (vph)	0	7	0	0	13	0	0	2	0	0	0	6
Lane Group Flow (vph)	0	53	0	0	67	0	5	314	0	18	216	5
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)		7.6			7.6		13.0	13.0		13.0	13.0	13.0
Effective Green, g (s)		7.6			7.6		13.0	13.0		13.0	13.0	13.0
Actuated g/C Ratio		0.26			0.26		0.44	0.44		0.44	0.44	0.44
Clearance Time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)		5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		448			439		506	808		462	813	691
v/s Ratio Prot							c0.17				0.12	
v/s Ratio Perm		0.03			c0.04		0.00			0.02		0.00
v/c Ratio		0.12			0.15		0.01	0.39		0.04	0.27	0.01
Uniform Delay, d1		8.5			8.6		4.8	5.7		4.8	5.4	4.7
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.2			0.3		0.0	0.7		0.1	0.4	0.0
Delay (s)		8.8			8.9		4.8	6.4		4.9	5.7	4.8
Level of Service		A			A		A	A		A	A	A
Approach Delay (s)		8.8			8.9			6.3			5.6	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.6			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			29.8						9.2			
Intersection Capacity Utilization			54.0%						A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 19th ST & Q Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	73	20	18	74	28	6	245	20	17	218	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.97			0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1806			1790		1770	1842		1770	1863	1583
Flt Permitted		0.97			0.95		0.59	1.00		0.53	1.00	1.00
Satd. Flow (perm)		1766			1715		1103	1842		981	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.88	0.88	0.88	0.74	0.74	0.74	0.80	0.80	0.80
Adj. Flow (vph)	9	78	21	20	84	32	8	331	27	21	272	14
RTOR Reduction (vph)	0	11	0	0	14	0	0	4	0	0	0	7
Lane Group Flow (vph)	0	97	0	0	122	0	8	354	0	21	272	7
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)		12.2			12.2		19.0	19.0		19.0	19.0	19.0
Effective Green, g (s)		12.2			12.2		19.0	19.0		19.0	19.0	19.0
Actuated g/C Ratio		0.30			0.30		0.47	0.47		0.47	0.47	0.47
Clearance Time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)		5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		533			518		519	866		461	876	744
v/s Ratio Prot								c0.19			0.15	
v/s Ratio Perm		0.05			c0.07		0.01			0.02		0.00
v/c Ratio		0.18			0.24		0.02	0.41		0.05	0.31	0.01
Uniform Delay, d1		10.4			10.6		5.7	7.0		5.8	6.6	5.7
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.3			0.5		0.0	0.7		0.1	0.4	0.0
Delay (s)		10.8			11.1		5.7	7.7		5.9	7.1	5.7
Level of Service		B			B		A	A		A	A	A
Approach Delay (s)		10.8			11.1			7.6			6.9	
Approach LOS		B			B			A			A	




















Intersection Summary

HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	9.2
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

39: 21st St & F St

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	183	22	11	96	23	6	233	14	43	453	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95			0.95	
Frt	1.00	1.00	0.85	1.00	0.97			0.99			0.98	
Frt Protected	0.95	1.00	1.00	0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1809			3506			3459	
Frt Permitted	0.66	1.00	1.00	0.61	1.00			0.94			0.91	
Satd. Flow (perm)	1238	1863	1583	1138	1809			3298			3163	
Peak-hour factor, PHF	0.77	0.77	0.77	0.82	0.82	0.82	0.81	0.81	0.81	0.79	0.79	0.79
Adj. Flow (vph)	99	238	29	13	117	28	7	288	17	54	573	91
RTOR Reduction (vph)	0	0	19	0	17	0	0	8	0	0	22	0
Lane Group Flow (vph)	99	238	10	13	128	0	0	304	0	0	696	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)	11.8	11.8	11.8	11.8	11.8			15.2			15.2	
Effective Green, g (s)	11.8	11.8	11.8	11.8	11.8			15.2			15.2	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33			0.43			0.43	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	410	618	525	377	600			1408			1350	
v/s Ratio Prot		c0.13			0.07							
v/s Ratio Perm	0.08		0.01	0.01				0.09			c0.22	
v/c Ratio	0.24	0.39	0.02	0.03	0.21			0.22			0.52	
Uniform Delay, d1	8.6	9.1	8.0	8.0	8.6			6.4			7.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.0	0.1			0.0			0.1	
Delay (s)	8.8	9.3	8.0	8.1	8.6			6.5			7.6	
Level of Service	A	A	A	A	A			A			A	
Approach Delay (s)		9.0			8.6			6.5			7.6	
Approach LOS		A			A			A			A	





















Intersection Summary

HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	35.6	Sum of lost time (s)	8.6
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

39: 21st St & F St





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	216	25	19	166	41	18	412	25	39	380	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95			0.95	
Frt	1.00	1.00	0.85	1.00	0.97			0.99			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1807			3503			3462	
Flt Permitted	0.62	1.00	1.00	0.59	1.00			0.92			0.88	
Satd. Flow (perm)	1155	1863	1583	1098	1807			3243			3048	
Peak-hour factor, PHF	0.78	0.78	0.78	0.94	0.94	0.94	0.80	0.80	0.80	0.89	0.89	0.89
Adj. Flow (vph)	88	277	32	20	177	44	22	515	31	44	427	63
RTOR Reduction (vph)	0	0	17	0	14	0	0	10	0	0	25	0
Lane Group Flow (vph)	88	277	15	20	207	0	0	558	0	0	509	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)	17.2	17.2	17.2	17.2	17.2			11.1			11.1	
Effective Green, g (s)	17.2	17.2	17.2	17.2	17.2			11.1			11.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47			0.30			0.30	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	538	868	738	512	842			976			917	
v/s Ratio Prot		c0.15			0.11							
v/s Ratio Perm	0.08		0.01	0.02				c0.17			0.17	
v/c Ratio	0.16	0.32	0.02	0.04	0.25			0.57			0.55	
Uniform Delay, d1	5.7	6.2	5.3	5.4	5.9			10.9			10.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.0	0.1			0.5			0.4	
Delay (s)	5.7	6.3	5.3	5.4	6.0			11.4			11.2	
Level of Service	A	A	A	A	A			B			B	
Approach Delay (s)		6.1			5.9			11.4			11.2	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			9.4			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			36.9			Sum of lost time (s)			8.6			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

40: 21st St & Q Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	64	11	13	133	14	13	249	10	12	174	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1823		1770	1837		1770	1852		1770	1846	
Flt Permitted	0.62	1.00		0.70	1.00		0.62	1.00		0.53	1.00	
Satd. Flow (perm)	1164	1823		1307	1837		1158	1852		992	1846	
Peak-hour factor, PHF	0.88	0.88	0.88	0.69	0.69	0.69	0.81	0.81	0.81	0.85	0.85	0.85
Adj. Flow (vph)	15	73	12	19	193	20	16	307	12	14	205	13
RTOR Reduction (vph)	0	7	0	0	4	0	0	2	0	0	3	0
Lane Group Flow (vph)	15	78	0	19	209	0	16	317	0	14	215	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.0	17.0		17.0	17.0		17.1	17.1		17.1	17.1	
Effective Green, g (s)	17.0	17.0		17.0	17.0		17.1	17.1		17.1	17.1	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.39	0.39		0.39	0.39	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	457	716		513	721		457	731		392	729	
v/s Ratio Prot		0.04			c0.11			c0.17			0.12	
v/s Ratio Perm	0.01			0.01			0.01			0.01		
v/c Ratio	0.03	0.11		0.04	0.29		0.04	0.43		0.04	0.29	
Uniform Delay, d1	8.1	8.3		8.1	9.0		8.0	9.6		8.0	9.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0		0.0	0.2		0.0	0.6		0.1	0.3	
Delay (s)	8.1	8.4		8.1	9.2		8.1	10.1		8.1	9.3	
Level of Service	A	A		A	A		A	B		A	A	
Approach Delay (s)		8.4			9.1			10.0			9.2	
Approach LOS		A			A			B			A	





















Intersection Summary

HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	43.3	Sum of lost time (s)	9.2
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

40: 21st St & Q Street

























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	114	10	9	79	10	13	291	4	6	202	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1840		1770	1832		1770	1859		1770	1855	
Flt Permitted	0.68	1.00		0.66	1.00		0.59	1.00		0.51	1.00	
Satd. Flow (perm)	1270	1840		1220	1832		1090	1859		952	1855	
Peak-hour factor, PHF	0.77	0.77	0.77	0.76	0.76	0.76	0.79	0.79	0.79	0.73	0.73	0.73
Adj. Flow (vph)	38	148	13	12	104	13	16	368	5	8	277	8
RTOR Reduction (vph)	0	4	0	0	6	0	0	1	0	0	1	0
Lane Group Flow (vph)	38	157	0	12	111	0	16	372	0	8	284	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	12.2	12.2		12.2	12.2		18.9	18.9		18.9	18.9	
Effective Green, g (s)	12.2	12.2		12.2	12.2		18.9	18.9		18.9	18.9	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.47	0.47		0.47	0.47	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	384	557		369	555		511	872		446	870	
v/s Ratio Prot		c0.09			0.06			c0.20			0.15	
v/s Ratio Perm	0.03			0.01			0.01			0.01		
v/c Ratio	0.10	0.28		0.03	0.20		0.03	0.43		0.02	0.33	
Uniform Delay, d1	10.1	10.7		9.9	10.4		5.8	7.1		5.7	6.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.0	0.1		0.0	0.5		0.0	0.3	
Delay (s)	10.2	10.9		9.9	10.6		5.8	7.6		5.8	7.0	
Level of Service	B	B		A	B		A	A		A	A	
Approach Delay (s)		10.8			10.5			7.5			7.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.4			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			40.3			Sum of lost time (s)			9.2			
Intersection Capacity Utilization			37.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: 21st Street & Union Ave












5/24/2011

												
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations										  	  	
Volume (vph)	3	18	15	30	9	19	6	26	44	290	696	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Lane Util. Factor		1.00	1.00		1.00	1.00			1.00	0.91	0.88	
Frt		1.00	0.90		1.00	0.91			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1770	1676		1770	1688			1770	5085	2787	
Flt Permitted		0.71	1.00		0.72	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1323	1676		1341	1688			1770	5085	2787	
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.71	0.71	0.71	0.71	0.89	0.89	0.89	0.89
Adj. Flow (vph)	4	23	19	38	13	27	8	37	49	326	782	25
RTOR Reduction (vph)	0	0	35	0	0	34	0	0	0	0	1	0
Lane Group Flow (vph)	0	27	22	0	13	38	0	0	49	326	806	0
Turn Type	Perm	Perm			Perm				Prot		Over	
Protected Phases			8			8			5	2	7	
Permitted Phases	8	8			8							
Actuated Green, G (s)		6.0	6.0		6.0	6.0			3.9	14.7	21.4	
Effective Green, g (s)		6.0	6.0		6.0	6.0			3.9	14.7	21.4	
Actuated g/C Ratio		0.09	0.09		0.09	0.09			0.06	0.22	0.32	
Clearance Time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Vehicle Extension (s)		0.2	0.2		0.2	0.2			2.0	6.8	8.0	
Lane Grp Cap (vph)		120	153		122	154			105	1134	905	
v/s Ratio Prot			0.01			c0.02			0.03	c0.06	c0.29	
v/s Ratio Perm		0.02			0.01							
v/c Ratio		0.23	0.15		0.11	0.25			0.47	0.29	0.89	
Uniform Delay, d1		27.8	27.6		27.5	27.9			30.0	21.3	21.1	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.2		0.1	0.3			1.2	0.5	12.8	
Delay (s)		28.1	27.8		27.6	28.2			31.2	21.7	33.9	
Level of Service		C	C		C	C			C	C	C	
Approach Delay (s)			27.9			28.1				30.5		
Approach LOS			C			C				C		
Intersection Summary												
HCM Average Control Delay			27.6		HCM Level of Service					C		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			65.9		Sum of lost time (s)				19.6			
Intersection Capacity Utilization			58.3%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: 21st Street & Union Ave





















5/24/2011

							
Movement	SBL2	SBL	SBT	SBR	SWL	SWR	SWR2
Lane Configurations							
Volume (vph)	8	40	242	5	908	101	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	5.1		4.7		
Lane Util. Factor		1.00	0.91		0.94		
Frt		1.00	1.00		0.98		
Flt Protected		0.95	1.00		0.96		
Satd. Flow (prot)		1770	5070		4922		
Flt Permitted		0.95	1.00		0.96		
Satd. Flow (perm)		1770	5070		4922		
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.79	0.79	0.79
Adj. Flow (vph)	10	50	302	6	1149	128	86
RTOR Reduction (vph)	0	0	2	0	5	0	0
Lane Group Flow (vph)	0	60	306	0	1358	0	0
Turn Type	Prot	Prot					
Protected Phases	1	1	6		7		
Permitted Phases							
Actuated Green, G (s)		4.2	15.0		21.4		
Effective Green, g (s)		4.2	15.0		21.4		
Actuated g/C Ratio		0.06	0.23		0.32		
Clearance Time (s)		4.7	5.1		4.7		
Vehicle Extension (s)		2.0	6.8		8.0		
Lane Grp Cap (vph)		113	1154		1598		
v/s Ratio Prot		0.03	0.06		0.28		
v/s Ratio Perm							
v/c Ratio		0.53	0.27		0.85		
Uniform Delay, d1		29.9	20.9		20.7		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		2.4	0.4		5.6		
Delay (s)		32.3	21.3		26.3		
Level of Service		C	C		C		
Approach Delay (s)			23.1		26.3		
Approach LOS			C		C		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

41: 21st Street & Union Ave

5/24/2011

												
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	8	71	23	32	19	11	5	49	46	362	854	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Lane Util. Factor		1.00	1.00		1.00	1.00			1.00	0.91	0.88	
Frt		1.00	0.91		1.00	0.88			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1770	1699		1770	1631			1770	5085	2787	
Flt Permitted		0.69	1.00		0.71	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1291	1699		1325	1631			1770	5085	2787	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.66	0.66	0.66	0.66	0.73	0.73	0.73	0.73
Adj. Flow (vph)	10	90	29	41	29	17	8	74	63	496	1170	23
RTOR Reduction (vph)	0	0	36	0	0	64	0	0	0	0	1	0
Lane Group Flow (vph)	0	100	34	0	29	35	0	0	63	496	1192	0
Turn Type	Perm	Perm			Perm				Prot		Over	
Protected Phases			8			8			5	2	7	
Permitted Phases	8	8			8							
Actuated Green, G (s)		10.0	10.0		10.0	10.0			6.0	20.6	20.8	
Effective Green, g (s)		10.0	10.0		10.0	10.0			6.0	20.6	20.8	
Actuated g/C Ratio		0.13	0.13		0.13	0.13			0.08	0.27	0.28	
Clearance Time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Vehicle Extension (s)		0.2	0.2		0.2	0.2			2.0	6.8	8.0	
Lane Grp Cap (vph)		172	227		177	217			142	1397	773	
v/s Ratio Prot			0.02			0.02			c0.04	c0.10	c0.43	
v/s Ratio Perm		c0.08			0.02							
v/c Ratio		0.58	0.15		0.16	0.16			0.44	0.36	1.54	
Uniform Delay, d1		30.5	28.7		28.8	28.8			32.9	21.9	27.1	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		3.2	0.1		0.2	0.1			0.8	0.5	250.5	
Delay (s)		33.7	28.9		29.0	28.9			33.7	22.4	277.6	
Level of Service		C	C		C	C			C	C	F	
Approach Delay (s)			31.7			28.9				196.6		
Approach LOS			C			C				F		

Intersection Summary

HCM Average Control Delay	113.9	HCM Level of Service	F
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		














dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

41: 21st Street & Union Ave

















5/24/2011

									
Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2	
Lane Configurations						 			
Volume (vph)	32	4	310	5	1	832	31	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.7	5.1			4.7			
Lane Util. Factor		1.00	0.91			0.94			
Frt		1.00	1.00			0.99			
Flt Protected		0.95	1.00			0.95			
Satd. Flow (prot)		1770	5072			4977			
Flt Permitted		0.95	1.00			0.85			
Satd. Flow (perm)		1770	5072			4415			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.81	0.81	0.81	0.81	
Adj. Flow (vph)	36	4	344	6	1	1027	38	17	
RTOR Reduction (vph)	0	0	2	0	0	1	0	0	
Lane Group Flow (vph)	0	40	348	0	0	1082	0	0	
Turn Type	Prot	Prot							
Protected Phases	1	1	6			7			
Permitted Phases									
Actuated Green, G (s)		4.0	18.6			20.8			
Effective Green, g (s)		4.0	18.6			20.8			
Actuated g/C Ratio		0.05	0.25			0.28			
Clearance Time (s)		4.7	5.1			4.7			
Vehicle Extension (s)		2.0	6.8			8.0			
Lane Grp Cap (vph)		94	1258			1224			
v/s Ratio Prot		0.02	0.07						
v/s Ratio Perm						0.24			
v/c Ratio		0.43	0.28			27.50dr			
Uniform Delay, d1		34.4	22.8			25.9			
Progression Factor		1.00	1.00			1.00			
Incremental Delay, d2		1.1	0.4			9.4			
Delay (s)		35.5	23.2			35.4			
Level of Service		D	C			D			
Approach Delay (s)			24.4			35.4			
Approach LOS			C			D			
Intersection Summary									

HCM Signalized Intersection Capacity Analysis

42: 23rd St & F St

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	2067	25	0	0	0	0	231	87	134	525	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6		4.2	5.6	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		1.00						0.96		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		5060						3394		1770	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		5060						3394		1770	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.84	0.84	0.84	0.73	0.73	0.73
Adj. Flow (vph)	152	2199	27	0	0	0	0	275	104	184	719	C
RTOR Reduction (vph)	0	1	0	0	0	0	0	40	0	0	0	C
Lane Group Flow (vph)	0	2377	0	0	0	0	0	339	0	184	719	C
Turn Type	Split									Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases												
Actuated Green, G (s)		29.5						12.2		10.0	26.4	
Effective Green, g (s)		29.5						12.2		10.0	26.4	
Actuated g/C Ratio		0.44						0.18		0.15	0.39	
Clearance Time (s)		5.6						5.6		4.2	5.6	
Vehicle Extension (s)		4.1						3.2		2.0	4.3	
Lane Grp Cap (vph)		2225						617		264	1392	
v/s Ratio Prot		c0.47						0.10		c0.10	c0.20	
v/s Ratio Perm												
v/c Ratio		1.07						0.55		0.70	0.52	
Uniform Delay, d1		18.8						25.0		27.1	15.5	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		40.4						1.0		6.3	0.5	
Delay (s)		59.2						26.0		33.4	16.0	
Level of Service		E						C		C	B	
Approach Delay (s)		59.2			0.0			26.0			19.5	
Approach LOS		E			A			C			B	
Intersection Summary												
HCM Average Control Delay			45.9									HCM Level of Service D
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			67.1							9.8		
Intersection Capacity Utilization			72.8%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: 23rd St & F St


















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1864	45	0	0	0	0	383	140	168	440	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6		4.2	5.6	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		1.00						0.96		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		5056						3397		1770	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		5056						3397		1770	3539	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	102	2004	48	0	0	0	0	435	159	189	494	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	35	0	0	0	0
Lane Group Flow (vph)	0	2151	0	0	0	0	0	559	0	189	494	0
Turn Type	Split									Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases												
Actuated Green, G (s)		29.6						18.1		10.2	32.5	
Effective Green, g (s)		29.6						18.1		10.2	32.5	
Actuated g/C Ratio		0.40						0.25		0.14	0.44	
Clearance Time (s)		5.6						5.6		4.2	5.6	
Vehicle Extension (s)		4.1						3.2		2.0	4.3	
Lane Grp Cap (vph)		2042						839		246	1569	
v/s Ratio Prot		c0.43						c0.16		c0.11	0.14	
v/s Ratio Perm												
v/c Ratio		1.05						0.67		0.77	0.31	
Uniform Delay, d1		21.8						24.9		30.4	13.2	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		35.7						2.0		12.2	0.2	
Delay (s)		57.6						26.9		42.6	13.4	
Level of Service		E						C		D	B	
Approach Delay (s)		57.6			0.0			26.9			21.5	
Approach LOS		E			A			C			C	
Intersection Summary												
HCM Average Control Delay		45.1										
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		73.3								15.4		
Intersection Capacity Utilization		76.1%								D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: 23rd St & Chester Ave






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	237	1891	32	0	0	0	0	359	132	112	507	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6	5.6	4.2	5.6	
Lane Util. Factor		0.91						0.95	1.00	1.00	0.95	
Frt		1.00						1.00	0.85	1.00	1.00	
Flt Protected		0.99						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5046						3539	1583	1770	3539	
Flt Permitted		0.99						1.00	1.00	0.95	1.00	
Satd. Flow (perm)		5046						3539	1583	1770	3539	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.84	0.84	0.84	0.85	0.85	0.85
Adj. Flow (vph)	263	2101	36	0	0	0	0	427	157	132	596	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	62	0	0	0
Lane Group Flow (vph)	0	2398	0	0	0	0	0	427	95	132	596	0
Turn Type	Split								Perm	Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases									8			
Actuated Green, G (s)		30.1						18.3	18.3	7.4	29.9	
Effective Green, g (s)		30.1						18.3	18.3	7.4	29.9	
Actuated g/C Ratio		0.42						0.26	0.26	0.10	0.42	
Clearance Time (s)		5.6						5.6	5.6	4.2	5.6	
Vehicle Extension (s)		4.2						5.3	5.3	2.0	3.9	
Lane Grp Cap (vph)		2133						910	407	184	1486	
v/s Ratio Prot		c0.48						c0.12		c0.07	0.17	
v/s Ratio Perm									0.06			
v/c Ratio		1.12						0.47	0.23	0.72	0.40	
Uniform Delay, d1		20.6						22.3	20.9	30.9	14.4	
Progression Factor		1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2		62.8						0.9	0.7	10.5	0.2	
Delay (s)		83.3						23.2	21.6	41.4	14.6	
Level of Service		F						C	C	D	B	
Approach Delay (s)		83.3			0.0			22.8			19.5	
Approach LOS		F			A			C			B	
Intersection Summary												
HCM Average Control Delay			61.3									HCM Level of Service E
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			71.2							15.4		
Intersection Capacity Utilization			73.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: 23rd St & Chester Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 			 	
Volume (vph)	215	1956	45	0	0	0	0	628	220	170	683	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6	5.6	4.2	5.6	
Lane Util. Factor		0.91						0.95	1.00	1.00	0.95	
Frt		1.00						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5045						3539	1583	1770	3539	
Flt Permitted		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (perm)		5045						3539	1583	1770	3539	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	231	2103	48	0	0	0	0	706	247	179	719	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	38	0	0	0
Lane Group Flow (vph)	0	2379	0	0	0	0	0	706	209	179	719	0
Turn Type	Split								Perm	Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases									8			
Actuated Green, G (s)		29.3						23.4	23.4	10.2	37.8	
Effective Green, g (s)		29.3						23.4	23.4	10.2	37.8	
Actuated g/C Ratio		0.37						0.30	0.30	0.13	0.48	
Clearance Time (s)		5.6						5.6	5.6	4.2	5.6	
Vehicle Extension (s)		4.2						5.3	5.3	2.0	3.9	
Lane Grp Cap (vph)		1888						1058	473	231	1708	
v/s Ratio Prot		c0.47						c0.20		c0.10	0.20	
v/s Ratio Perm									0.13			
v/c Ratio		1.26						0.67	0.44	0.77	0.42	
Uniform Delay, d1		24.5						24.0	22.2	32.9	13.1	
Progression Factor		1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2		121.6						2.2	1.5	13.7	0.2	
Delay (s)		146.1						26.3	23.7	46.6	13.4	
Level of Service		F						C	C	D	B	
Approach Delay (s)		146.1			0.0			25.6			20.0	
Approach LOS		F			A			C			C	
Intersection Summary												
HCM Average Control Delay			92.2									HCM Level of Service F
HCM Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			78.3							15.4		
Intersection Capacity Utilization			82.8%							E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

44: 23rd St & Q Street

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	3	7	5	2	7	5	233	4	4	202	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.56	0.56	0.56	0.50	0.50	0.50	0.84	0.84	0.84	0.80	0.80	0.80
Hourly flow rate (vph)	14	5	12	10	4	14	6	277	5	5	252	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								722			817	
pX, platoon unblocked	0.97	0.97	0.97	0.97	0.97		0.97					
vC, conflicting volume	574	560	256	573	562	280	260			282		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	549	535	223	548	537	280	227			282		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	98	98	99	98	100			100		
cM capacity (veh/h)	421	436	795	422	435	759	1307			1280		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	32	28	288	265								
Volume Left	14	10	6	5								
Volume Right	12	14	5	8								
cSH	519	545	1307	1280								
Volume to Capacity	0.06	0.05	0.00	0.00								
Queue Length 95th (ft)	5	4	0	0								
Control Delay (s)	12.4	12.0	0.2	0.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.4	12.0	0.2	0.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			25.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis













44: 23rd St & Q Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	0	3	8	3	7	4	338	2	5	210	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.58	0.58	0.64	0.64	0.64	0.74	0.74	0.74	0.79	0.79	0.79
Hourly flow rate (vph)	7	0	5	12	5	11	5	457	3	6	266	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								722			817	
pX, platoon unblocked	0.94	0.94	0.93	0.94	0.94	0.98	0.93			0.98		
vC, conflicting volume	764	752	269	756	754	458	272			459		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	667	654	180	658	656	434	184			436		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	96	99	98	100			99		
cM capacity (veh/h)	339	361	805	351	360	608	1298			1099		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	28	465	278								
Volume Left	7	12	5	6								
Volume Right	5	11	3	6								
cSH	451	422	1298	1099								
Volume to Capacity	0.03	0.07	0.00	0.01								
Queue Length 95th (ft)	2	5	0	0								
Control Delay (s)	13.2	14.1	0.1	0.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	13.2	14.1	0.1	0.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			29.8%		ICU Level of Service					A		
Analysis Period (min)			15									
























HCM Signalized Intersection Capacity Analysis 45: SR-178 & SR 99 SB OFF RAMP

5/24/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
												
Lane Configurations		↑↑↑	↑		↑↑↑					↑	↑↓	
Volume (vph)	0	1414	744	0	1553	611	0	0	0	171	0	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.4		4.4					4.1	4.0	
Lane Util. Factor		0.86	0.86		0.91					0.95	0.95	
Frt		0.98	0.85		0.96					1.00	0.86	
Flt Protected		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (prot)		4694	1362		4870					1681	1522	
Flt Permitted		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (perm)		4694	1362		4870					1681	1522	
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	1520	800	0	1806	710	0	0	0	190	0	180
RTOR Reduction (vph)	0	20	173	0	60	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	1780	347	0	2456	0	0	0	0	171	194	0
Turn Type		Perm								Prot		
Protected Phases		2			6					4		
Permitted Phases			2									
Actuated Green, G (s)		36.4	36.4		36.4					9.7	9.7	
Effective Green, g (s)		36.4	36.4		36.4					9.7	9.7	
Actuated g/C Ratio		0.67	0.67		0.67					0.18	0.18	
Clearance Time (s)		4.4	4.4		4.4					4.1		
Vehicle Extension (s)		4.5	4.5		4.5					4.1		
Lane Grp Cap (vph)		3129	908		3247					299	270	
v/s Ratio Prot		0.38			c0.50					0.10	0.13	
v/s Ratio Perm			0.25									
v/c Ratio		0.57	0.38		0.76					0.57	0.72	
Uniform Delay, d1		4.9	4.1		6.1					20.5	21.2	
Progression Factor		1.00	1.00		1.00					1.00	1.00	
Incremental Delay, d2		0.3	0.5		1.2					3.3	9.5	
Delay (s)		5.2	4.5		7.3					23.8	30.7	
Level of Service		A	A		A					C	C	
Approach Delay (s)		5.1			7.3			0.0			27.5	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM Average Control Delay			7.7			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			54.6			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			60.4%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 45: SR-178 & SR 99 SB OFF RAMP




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  					 	 	
Volume (vph)	0	1277	884	0	2151	615	0	0	0	179	0	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.4		4.4					4.1	4.0	
Lane Util. Factor		0.86	0.86		0.91					0.95	0.95	
Frt		0.96	0.85		0.97					1.00	0.86	
Flt Protected		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (prot)		4638	1362		4916					1681	1517	
Flt Permitted		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (perm)		4638	1362		4916					1681	1517	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	0	1303	902	0	2195	628	0	0	0	206	0	283
RTOR Reduction (vph)	0	51	186	0	48	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1649	319	0	2775	0	0	0	0	185	302	0
Turn Type			Perm								Prot	
Protected Phases		2			6						4	
Permitted Phases			2									
Actuated Green, G (s)		35.7	35.7		35.7					12.4	12.4	
Effective Green, g (s)		35.7	35.7		35.7					12.4	12.4	
Actuated g/C Ratio		0.63	0.63		0.63					0.22	0.22	
Clearance Time (s)		4.4	4.4		4.4					4.1		
Vehicle Extension (s)		4.5	4.5		4.5					4.1		
Lane Grp Cap (vph)		2925	859		3101					368	332	
v/s Ratio Prot		0.36			c0.56					0.11	0.20	
v/s Ratio Perm			0.23									
v/c Ratio		0.56	0.37		0.89					0.50	0.91	
Uniform Delay, d1		6.0	5.0		8.9					19.4	21.6	
Progression Factor		1.00	1.00		1.00					1.00	1.00	
Incremental Delay, d2		0.4	0.5		4.0					1.6	28.5	
Delay (s)		6.3	5.5		12.8					20.9	50.0	
Level of Service		A	A		B					C	D	
Approach Delay (s)		6.2			12.8			0.0			39.0	
Approach LOS		A			B			A			D	
Intersection Summary												
HCM Average Control Delay			12.5			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			56.6			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			74.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: SR-178 & Buck Owens Blvd




















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	302	1296	0	0	1166	383	731	0	0	198	0	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97			0.97		1.00
Frt	1.00	1.00			1.00	0.85	1.00			1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (prot)	3433	5085			5085	1583	3433			3433		1583
Flt Permitted	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (perm)	3433	5085			5085	1583	3433			3433		1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.83	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.84
Adj. Flow (vph)	332	1424	0	0	1405	461	881	0	0	236	0	320
RTOR Reduction (vph)	0	0	0	0	0	330	0	0	0	0	0	8
Lane Group Flow (vph)	332	1424	0	0	1405	131	881	0	0	236	0	312
Turn Type	Prot					Over	Prot			Prot		Over
Protected Phases	5	2			6	4	8			4		5
Permitted Phases												
Actuated Green, G (s)	19.8	60.1			35.1	28.0	28.0			28.0		19.8
Effective Green, g (s)	19.8	60.1			35.1	28.0	28.0			28.0		19.8
Actuated g/C Ratio	0.20	0.61			0.35	0.28	0.28			0.28		0.20
Clearance Time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Vehicle Extension (s)	2.0	4.5			4.5	4.5	3.3			4.5		2.0
Lane Grp Cap (vph)	687	3090			1805	448	972			972		317
v/s Ratio Prot	0.10	0.28			c0.28	0.08	c0.26			0.07		c0.20
v/s Ratio Perm												
v/c Ratio	0.48	0.46			0.78	0.29	0.91			0.24		0.98
Uniform Delay, d1	35.0	10.6			28.4	27.7	34.2			27.3		39.4
Progression Factor	1.00	1.00			1.00	1.00	1.00			1.00		1.00
Incremental Delay, d2	0.2	0.2			2.5	0.6	11.9			0.2		45.8
Delay (s)	35.2	10.8			30.9	28.3	46.1			27.5		85.2
Level of Service	D	B			C	C	D			C		F
Approach Delay (s)		15.4			30.3			46.1			60.7	
Approach LOS		B			C			D			E	
Intersection Summary												
HCM Average Control Delay			31.2									
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			98.9									
Intersection Capacity Utilization			71.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: SR-178 & Buck Owens Blvd






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	389	1115	0	0	1838	362	718	0	0	440	0	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97			0.97		1.00
Frt	1.00	1.00			1.00	0.85	1.00			1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (prot)	3433	5085			5085	1583	3433			3433		1583
Flt Permitted	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (perm)	3433	5085			5085	1583	3433			3433		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	401	1149	0	0	1915	377	780	0	0	494	0	488
RTOR Reduction (vph)	0	0	0	0	0	219	0	0	0	0	0	10
Lane Group Flow (vph)	401	1149	0	0	1915	158	780	0	0	494	0	478
Turn Type	Prot					Over	Prot			Prot		Over
Protected Phases	5	2			6	4	8			4		5
Permitted Phases												
Actuated Green, G (s)	19.8	60.2			35.2	26.3	26.3			26.3		19.8
Effective Green, g (s)	19.8	60.2			35.2	26.3	26.3			26.3		19.8
Actuated g/C Ratio	0.20	0.62			0.36	0.27	0.27			0.27		0.20
Clearance Time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Vehicle Extension (s)	2.0	4.5			4.5	4.5	3.3			4.5		2.0
Lane Grp Cap (vph)	699	3146			1840	428	928			928		322
v/s Ratio Prot	0.12	0.23			c0.38	0.10	c0.23			0.14		c0.30
v/s Ratio Perm												
v/c Ratio	0.57	0.37			1.04	0.37	0.84			0.53		1.48
Uniform Delay, d1	34.9	9.1			31.0	28.8	33.5			30.3		38.8
Progression Factor	1.00	1.00			1.00	1.00	1.00			1.00		1.00
Incremental Delay, d2	0.7	0.1			32.5	0.9	7.0			0.9		233.5
Delay (s)	35.7	9.3			63.5	29.7	40.6			31.2		272.2
Level of Service	D	A			E	C	D			C		F
Approach Delay (s)		16.1			57.9			40.6			151.0	
Approach LOS		B			E			D			F	
Intersection Summary												
HCM Average Control Delay			60.3									
HCM Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			97.3									
Intersection Capacity Utilization			94.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: 24th St & Oak St






















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	1764	440	559	1195	4	306	8	443	14	16	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	3433	3537		1681	1689	1583		1751	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	
Satd. Flow (perm)	1770	3539	1583	3433	3537		1681	1689	1583		1751	
Peak-hour factor, PHF	0.91	0.91	0.91	0.82	0.82	0.82	0.90	0.90	0.90	0.75	0.75	0.75
Adj. Flow (vph)	29	1938	484	682	1457	5	340	9	492	19	21	20
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	406	0	14	0
Lane Group Flow (vph)	29	1938	365	682	1462	0	173	176	86	0	46	0
Turn Type	Prot		Perm	Prot			Split		Over	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases			2									
Actuated Green, G (s)	11.9	56.3	56.3	19.9	66.3		19.8	19.8	19.9		6.1	
Effective Green, g (s)	11.9	56.3	56.3	19.9	66.3		19.8	19.8	19.9		6.1	
Actuated g/C Ratio	0.10	0.46	0.46	0.16	0.54		0.16	0.16	0.16		0.05	
Clearance Time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Vehicle Extension (s)	2.0	5.7	5.7	2.0	5.7		5.6	5.6	2.0		1.0	
Lane Grp Cap (vph)	171	1613	722	553	1899		270	271	255		86	
v/s Ratio Prot	0.02	c0.55		c0.20	0.41		0.10	c0.10	0.05		c0.03	
v/s Ratio Perm			0.23									
v/c Ratio	0.17	1.20	0.51	1.23	0.77		0.64	0.65	0.34		0.53	
Uniform Delay, d1	51.3	33.6	23.8	51.8	22.6		48.5	48.6	46.0		57.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.2	96.9	1.4	120.0	2.4		7.7	8.0	0.3		3.1	
Delay (s)	51.4	130.5	25.2	171.8	25.0		56.2	56.6	46.2		60.4	
Level of Service	D	F	C	F	C		E	E	D		E	
Approach Delay (s)		108.8			71.7			50.5			60.4	
Approach LOS		F			E			D			E	
Intersection Summary												
HCM Average Control Delay			84.9			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			123.5			Sum of lost time (s)			21.4			
Intersection Capacity Utilization			94.2%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: 24th St & Oak St

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	1543	428	496	1637	12	576	9	437	19	20	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	
Satd. Flow (prot)	1770	3539	1583	3433	3535		1681	1688	1583		1755	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	
Satd. Flow (perm)	1770	3539	1583	3433	3535		1681	1688	1583		1755	
Peak-hour factor, PHF	0.89	0.89	0.89	0.94	0.94	0.94	0.87	0.87	0.87	0.82	0.82	0.82
Adj. Flow (vph)	40	1734	481	528	1741	13	662	10	502	23	24	21
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	403	0	12	0
Lane Group Flow (vph)	40	1734	344	528	1754	0	338	334	99	0	56	0
Turn Type	Prot		Perm	Prot			Split		Over	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases			2									
Actuated Green, G (s)	12.2	56.1	56.1	19.8	65.7		24.1	24.1	19.8		6.7	
Effective Green, g (s)	12.2	56.1	56.1	19.8	65.7		24.1	24.1	19.8		6.7	
Actuated g/C Ratio	0.10	0.44	0.44	0.15	0.51		0.19	0.19	0.15		0.05	
Clearance Time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Vehicle Extension (s)	2.0	5.7	5.7	2.0	5.7		5.6	5.6	2.0		1.0	
Lane Grp Cap (vph)	169	1550	693	531	1813		316	318	245		92	
v/s Ratio Prot	0.02	c0.49		0.15	c0.50		c0.20	0.20	0.06		c0.03	
v/s Ratio Perm			0.22									
v/c Ratio	0.24	1.12	0.50	0.99	0.97		1.07	1.05	0.40		0.61	
Uniform Delay, d1	53.6	36.0	25.9	54.1	30.2		52.0	52.0	48.8		59.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.3	62.7	1.5	37.3	14.4		70.3	64.3	0.4		7.5	
Delay (s)	53.9	98.7	27.3	91.4	44.6		122.3	116.3	49.2		66.9	
Level of Service	D	F	C	F	D		F	F	D		E	
Approach Delay (s)		82.7			55.4			89.3			66.9	
Approach LOS		F			E			F			E	
Intersection Summary												
HCM Average Control Delay			73.1			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			128.1			Sum of lost time (s)			21.1			
Intersection Capacity Utilization			93.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: 24TH ST & F St























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	273	1505	99	77	367	0	0	434	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		3.7	4.6			4.6	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frt					0.99		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					5009		1770	3539			3472	
Flt Permitted					0.99		0.95	1.00			1.00	
Satd. Flow (perm)					5009		1770	3539			3472	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.78	0.78	0.78
Adj. Flow (vph)	0	0	0	333	1835	121	82	390	0	0	556	81
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	13	C
Lane Group Flow (vph)	0	0	0	0	2283	0	82	390	0	0	624	C
Turn Type				Split			Prot					
Protected Phases				6	6		3	8			4	
Permitted Phases												
Actuated Green, G (s)					30.8		6.5	31.7			21.5	
Effective Green, g (s)					30.8		6.5	31.7			21.5	
Actuated g/C Ratio					0.43		0.09	0.44			0.30	
Clearance Time (s)					4.6		3.7	4.6			4.6	
Vehicle Extension (s)					4.8		2.0	2.9			5.1	
Lane Grp Cap (vph)					2152		160	1565			1041	
v/s Ratio Prot					c0.46		c0.05	0.11			c0.18	
v/s Ratio Perm												
v/c Ratio					1.06		0.51	0.25			0.60	
Uniform Delay, d1					20.5		31.1	12.5			21.4	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					38.0		1.2	0.1			1.4	
Delay (s)					58.4		32.2	12.6			22.9	
Level of Service					E		C	B			C	
Approach Delay (s)		0.0			58.4			16.0			22.9	
Approach LOS		A			E			B			C	
Intersection Summary												
HCM Average Control Delay			45.9									D
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			71.7									
Intersection Capacity Utilization			72.8%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis






















48: 24TH ST & F St

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  		 	 			  	
Volume (vph)	0	0	0	210	1753	58	118	356	0	0	377	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		3.7	4.6			4.6	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frt					1.00		1.00	1.00			0.97	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					5037		1770	3539			3424	
Flt Permitted					0.99		0.95	1.00			1.00	
Satd. Flow (perm)					5037		1770	3539			3424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	223	1865	62	134	405	0	0	428	119
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	28	0
Lane Group Flow (vph)	0	0	0	0	2147	0	134	405	0	0	519	0
Turn Type				Split			Prot					
Protected Phases				6	6		3	8			4	
Permitted Phases												
Actuated Green, G (s)					31.1		8.4	31.9			19.8	
Effective Green, g (s)					31.1		8.4	31.9			19.8	
Actuated g/C Ratio					0.43		0.12	0.44			0.27	
Clearance Time (s)					4.6		3.7	4.6			4.6	
Vehicle Extension (s)					4.8		2.0	2.9			5.1	
Lane Grp Cap (vph)					2170		206	1564			939	
v/s Ratio Prot					c0.43		c0.08	0.11			c0.15	
v/s Ratio Perm												
v/c Ratio					0.99		0.65	0.26			0.55	
Uniform Delay, d1					20.4		30.5	12.7			22.4	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					16.8		5.5	0.1			1.2	
Delay (s)					37.2		36.0	12.8			23.6	
Level of Service					D		D	B			C	
Approach Delay (s)		0.0			37.2			18.6			23.6	
Approach LOS		A			D			B			C	
Intersection Summary												
HCM Average Control Delay			31.8				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			72.2				Sum of lost time (s)		12.9			
Intersection Capacity Utilization			76.1%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

49: 24TH ST & Chester Ave


















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  			 			 	
Volume (vph)	0	0	0	175	1990	61	98	525	0	0	498	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		4.2	4.6			4.6	4.6
Lane Util. Factor					0.91		1.00	0.95			0.95	1.00
Frt					1.00		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					5045		1770	3539			3539	1583
Flt Permitted					1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)					5045		1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.88	0.88	0.88	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	192	2187	67	111	597	0	0	519	131
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	73
Lane Group Flow (vph)	0	0	0	0	2443	0	111	597	0	0	519	58
Turn Type				Split			Prot					Prot
Protected Phases				6	6		3	8			4	4
Permitted Phases												
Actuated Green, G (s)					31.2		7.6	32.2			20.4	20.4
Effective Green, g (s)					31.2		7.6	32.2			20.4	20.4
Actuated g/C Ratio					0.43		0.10	0.44			0.28	0.28
Clearance Time (s)					4.6		4.2	4.6			4.6	4.6
Vehicle Extension (s)					4.9		2.0	3.1			5.2	5.2
Lane Grp Cap (vph)					2168		185	1570			994	445
v/s Ratio Prot					c0.48		c0.06	0.17			c0.15	0.04
v/s Ratio Perm												
v/c Ratio					1.13		0.60	0.38			0.52	0.13
Uniform Delay, d1					20.7		31.0	13.5			22.0	19.5
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					63.7		3.5	0.2			1.0	0.3
Delay (s)					84.4		34.5	13.7			23.0	19.8
Level of Service					F		C	B			C	B
Approach Delay (s)		0.0			84.4			16.9			22.3	
Approach LOS		A			F			B			C	
Intersection Summary												
HCM Average Control Delay			61.3		HCM Level of Service					E		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			72.6		Sum of lost time (s)					13.4		
Intersection Capacity Utilization			73.7%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: 24TH ST & Chester Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	159	1782	91	183	670	0	0	677	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		4.2	4.6			4.6	4.6
Lane Util. Factor					0.91		1.00	0.95			0.95	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					5031		1770	3539			3539	1583
Flt Permitted					1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)					5031		1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	167	1876	96	191	698	0	0	736	175
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	0	67
Lane Group Flow (vph)	0	0	0	0	2134	0	191	698	0	0	736	108
Turn Type				Split			Prot					Prot
Protected Phases				6	6		3	8			4	4
Permitted Phases												
Actuated Green, G (s)					30.4		13.0	41.5			24.3	24.3
Effective Green, g (s)					30.4		13.0	41.5			24.3	24.3
Actuated g/C Ratio					0.37		0.16	0.51			0.30	0.30
Clearance Time (s)					4.6		4.2	4.6			4.6	4.6
Vehicle Extension (s)					4.9		2.0	3.1			5.2	5.2
Lane Grp Cap (vph)					1886		284	1811			1060	474
v/s Ratio Prot					c0.42		c0.11	0.20			c0.21	0.07
v/s Ratio Perm												
v/c Ratio					1.13		0.67	0.39			0.69	0.23
Uniform Delay, d1					25.3		32.0	12.0			25.1	21.3
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					66.5		4.9	0.1			2.6	0.5
Delay (s)					91.8		36.9	12.2			27.7	21.9
Level of Service					F		D	B			C	C
Approach Delay (s)		0.0			91.8			17.5			26.6	
Approach LOS		A			F			B			C	
Intersection Summary												
HCM Average Control Delay			60.0									
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			81.1									
Intersection Capacity Utilization			82.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Monterey Street & Beale Ave


















5/24/2011

										
Movement	EBL	EBT	EBR	EBR2	NBT	NBR	SBL2	SBT	SBR	NWR2
Lane Configurations										
Volume (vph)	21	151	7	2	332	139	61	575	18	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.0	4.9		4.9
Lane Util. Factor		0.91			0.91	0.91	1.00	0.95		1.00
Frt		0.99			0.99	0.85	1.00	1.00		0.86
Flt Protected		0.99			1.00	1.00	0.95	1.00		1.00
Satd. Flow (prot)		5018			3370	1441	1770	3523		1611
Flt Permitted		0.99			1.00	1.00	0.95	1.00		1.00
Satd. Flow (perm)		5018			3370	1441	1770	3523		1611
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.85	0.85	0.70	0.70	0.70	0.67
Adj. Flow (vph)	23	166	8	2	391	164	87	821	26	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	18
Lane Group Flow (vph)	0	199	0	0	407	148	87	847	0	6
Turn Type	Perm					Perm	Prot			custom
Protected Phases		4			2		1	6		
Permitted Phases	4					2				8
Actuated Green, G (s)		13.9			27.3	27.3	4.5	28.3		13.9
Effective Green, g (s)		13.9			27.3	27.3	4.5	28.3		13.9
Actuated g/C Ratio		0.23			0.46	0.46	0.08	0.48		0.23
Clearance Time (s)		4.9			4.9	4.9	4.0	4.9		4.9
Vehicle Extension (s)		2.0			2.0	2.0	3.0	2.0		2.0
Lane Grp Cap (vph)		1172			1546	661	134	1676		376
v/s Ratio Prot					c0.12		0.05	c0.24		
v/s Ratio Perm		0.04				0.10				0.00
v/c Ratio		0.17			0.26	0.22	0.65	0.51		0.01
Uniform Delay, d1		18.2			9.9	9.7	26.7	10.8		17.5
Progression Factor		1.00			1.00	1.00	1.23	0.48		1.00
Incremental Delay, d2		0.0			0.0	0.1	10.1	0.1		0.0
Delay (s)		18.2			9.9	9.8	43.1	5.3		17.5
Level of Service		B			A	A	D	A		B
Approach Delay (s)		18.2			9.9			8.8		
Approach LOS		B			A			A		
Intersection Summary										
HCM Average Control Delay			10.4		HCM Level of Service				B	
HCM Volume to Capacity ratio			0.36							
Actuated Cycle Length (s)			59.5		Sum of lost time (s)				9.8	
Intersection Capacity Utilization			36.5%		ICU Level of Service				A	
Analysis Period (min)			15							
c Critical Lane Group										

HCM Signalized Intersection Capacity Analysis

50: Monterey Street & Beale Ave





















5/24/2011

											
Movement	EBL	EBT	EBR	EBR2	NBT	NBR	SBL2	SBT	SBR	NWR2	
Lane Configurations											
Volume (vph)	55	327	9	15	545	238	56	517	16	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.9			4.9	4.9	4.0	4.9		4.9	
Lane Util. Factor		0.91			0.91	0.91	1.00	0.95		1.00	
Frt		0.99			0.99	0.85	1.00	1.00		0.86	
Flt Protected		0.99			1.00	1.00	0.95	1.00		1.00	
Satd. Flow (prot)		5007			3369	1441	1770	3523		1611	
Flt Permitted		0.99			1.00	1.00	0.95	1.00		1.00	
Satd. Flow (perm)		5007			3369	1441	1770	3523		1611	
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.80	0.80	0.96	0.96	0.96	0.79	
Adj. Flow (vph)	71	425	12	19	681	298	58	539	17	24	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	18	
Lane Group Flow (vph)	0	527	0	0	711	268	58	556	0	6	
Turn Type	Perm					Perm	Prot			custom	
Protected Phases		4			2		1	6			
Permitted Phases	4					2				8	
Actuated Green, G (s)		13.0			25.5	25.5	3.5	20.6		13.0	
Effective Green, g (s)		13.0			25.5	25.5	3.5	20.6		13.0	
Actuated g/C Ratio		0.23			0.46	0.46	0.06	0.37		0.23	
Clearance Time (s)		4.9			4.9	4.9	4.0	4.9		4.9	
Vehicle Extension (s)		2.0			2.0	2.0	1.0	2.0		2.0	
Lane Grp Cap (vph)		1167			1540	659	111	1301		375	
v/s Ratio Prot					c0.21		0.03	c0.16			
v/s Ratio Perm		0.11				0.19				0.00	
v/c Ratio		0.45			0.46	0.41	0.52	0.43		0.01	
Uniform Delay, d1		18.3			10.4	10.1	25.3	13.2		16.5	
Progression Factor		1.00			1.00	1.00	1.33	0.39		1.00	
Incremental Delay, d2		0.1			0.1	0.1	2.0	0.1		0.0	
Delay (s)		18.4			10.5	10.3	35.6	5.3		16.5	
Level of Service		B			B	B	D	A		B	
Approach Delay (s)		18.4			10.4			8.1			
Approach LOS		B			B			A			
Intersection Summary											
HCM Average Control Delay			11.8		HCM Level of Service				B		
HCM Volume to Capacity ratio			0.48								
Actuated Cycle Length (s)			55.8		Sum of lost time (s)				14.7		
Intersection Capacity Utilization			47.8%		ICU Level of Service				A		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

51: Golden State Ave & Q Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	903	53	0	290	66	32	172	34	86	139	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.91			0.91		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99			0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5043			4943		1770	3451		1770	1863	1583
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5043			4943		1770	3451		1770	1863	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.85	0.85	0.85	0.88	0.88	0.88	0.71	0.71	0.71
Adj. Flow (vph)	107	1026	60	0	341	78	36	195	39	121	196	66
RTOR Reduction (vph)	0	8	0	0	42	0	0	20	0	0	0	54
Lane Group Flow (vph)	107	1078	0	0	377	0	36	214	0	121	196	12
Turn Type	Prot						Split			Split		Perm
Protected Phases	1	6			2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	6.9	29.2			18.6		11.0	11.0		12.5	12.5	12.5
Effective Green, g (s)	6.9	29.2			18.6		11.0	11.0		12.5	12.5	12.5
Actuated g/C Ratio	0.10	0.44			0.28		0.16	0.16		0.19	0.19	0.19
Clearance Time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	1.5	4.5			4.5		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	183	2204			1376		291	568		331	349	296
v/s Ratio Prot	c0.06	c0.21			0.08		0.02	c0.06		0.07	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.58	0.49			0.27		0.12	0.38		0.37	0.56	0.04
Uniform Delay, d1	28.6	13.5			18.8		23.8	24.8		23.7	24.7	22.2
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	0.3			0.2		0.2	0.4		0.7	2.1	0.1
Delay (s)	31.6	13.8			19.0		24.0	25.3		24.4	26.7	22.3
Level of Service	C	B			B		C	C		C	C	C
Approach Delay (s)		15.4			19.0			25.1			25.2	
Approach LOS		B			B			C			C	





















Intersection Summary

HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	12.9
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

51: Golden State Ave & Q Street

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	1240	54	0	405	82	67	189	75	80	184	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.91			0.91		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99			0.97		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5053			4957		1770	3388		1770	1863	1583
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5053			4957		1770	3388		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.80	0.80	0.80	0.85	0.85	0.85
Adj. Flow (vph)	104	1348	59	0	555	112	84	236	94	94	216	61
RTOR Reduction (vph)	0	5	0	0	31	0	0	51	0	0	0	51
Lane Group Flow (vph)	104	1402	0	0	636	0	84	279	0	94	216	10
Turn Type	Prot						Split			Split		Perm
Protected Phases	1	6			2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	7.3	37.7			26.7		12.3	12.3		13.3	13.3	13.3
Effective Green, g (s)	7.3	37.7			26.7		12.3	12.3		13.3	13.3	13.3
Actuated g/C Ratio	0.09	0.49			0.34		0.16	0.16		0.17	0.17	0.17
Clearance Time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	1.5	4.5			4.5		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	167	2461			1710		281	538		304	320	272
v/s Ratio Prot	0.06	c0.28			0.13		0.05	c0.08		0.05	c0.12	
v/s Ratio Perm												0.01
v/c Ratio	0.62	0.57			0.37		0.30	0.52		0.31	0.68	0.04
Uniform Delay, d1	33.7	14.1			19.1		28.7	29.8		28.0	30.0	26.7
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	0.4			0.2		0.6	0.8		0.6	5.5	0.1
Delay (s)	38.8	14.5			19.3		29.3	30.7		28.6	35.6	26.8
Level of Service	D	B			B		C	C		C	D	C
Approach Delay (s)		16.2			19.3			30.4			32.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			20.9			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			77.4			Sum of lost time (s)			14.1			
Intersection Capacity Utilization			54.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												


















52: Espee St & Union Ave

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HCM Signalized Intersection Capacity Analysis

52: Espee St & Union Ave


















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	224	28	0	0	0	0	763	381	291	743	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.4		3.7	4.4	
Lane Util. Factor	1.00	0.91						0.91		1.00	0.91	
Frt	1.00	0.98						0.95		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	5001						4831		1770	5085	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1770	5001						4831		1770	5085	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	214	267	33	0	0	0	0	857	428	310	790	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	99	0	0	0	0
Lane Group Flow (vph)	214	280	0	0	0	0	0	1186	0	310	790	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.0	14.0						25.1		16.2	45.0	
Effective Green, g (s)	14.0	14.0						25.1		16.2	45.0	
Actuated g/C Ratio	0.21	0.21						0.37		0.24	0.67	
Clearance Time (s)	4.1	4.1						4.4		3.7	4.4	
Vehicle Extension (s)	3.0	3.0						4.0		2.0	4.0	
Lane Grp Cap (vph)	367	1037						1796		425	3390	
v/s Ratio Prot	c0.12	0.06						c0.25		c0.18	0.16	
v/s Ratio Perm												
v/c Ratio	0.58	0.27						0.66		0.73	0.23	
Uniform Delay, d1	24.1	22.5						17.7		23.6	4.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.1						1.0		5.3	0.0	
Delay (s)	26.5	22.6						18.7		28.9	4.5	
Level of Service	C	C						B		C	A	
Approach Delay (s)		24.2			0.0			18.7			11.4	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM Average Control Delay			16.9									
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			67.5									
Intersection Capacity Utilization			59.8%									
Analysis Period (min)			15									
c Critical Lane Group												
			HCM Level of Service			B						
			Sum of lost time (s)			12.2						
			ICU Level of Service			B						

HCM Signalized Intersection Capacity Analysis

53: Niles St & Beale Ave



















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	232	220	43	44	307	0	0	432	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.9	4.9		4.0	4.9			4.9	
Lane Util. Factor				0.91	0.91		1.00	0.95			0.95	
Frt				1.00	0.98		1.00	1.00			0.99	
Flt Protected				0.95	0.99		0.95	1.00			1.00	
Satd. Flow (prot)				1610	3290		1770	3539			3516	
Flt Permitted				0.95	0.99		0.95	1.00			1.00	
Satd. Flow (perm)				1610	3290		1770	3539			3516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.82	0.82	0.82	0.54	0.54	0.54
Adj. Flow (vph)	0	0	0	273	259	51	54	374	0	0	800	37
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	191	382	0	54	374	0	0	835	0
Turn Type				Perm			Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				13.9	13.9		3.5	27.3			28.3	
Effective Green, g (s)				13.9	13.9		3.5	27.3			28.3	
Actuated g/C Ratio				0.23	0.23		0.06	0.46			0.48	
Clearance Time (s)				4.9	4.9		4.0	4.9			4.9	
Vehicle Extension (s)				2.0	2.0		1.0	2.0			2.0	
Lane Grp Cap (vph)				376	769		104	1624			1672	
v/s Ratio Prot							c0.03	0.11			c0.24	
v/s Ratio Perm				c0.12	0.12							
v/c Ratio				0.51	0.50		0.52	0.23			0.50	
Uniform Delay, d1				19.8	19.8		27.2	9.7			10.7	
Progression Factor				1.00	1.00		0.73	0.58			1.00	
Incremental Delay, d2				0.4	0.2		1.8	0.0			0.1	
Delay (s)				20.2	20.0		21.7	5.7			10.8	
Level of Service				C	B		C	A			B	
Approach Delay (s)		0.0			20.0			7.7			10.8	
Approach LOS		A			C			A			B	
Intersection Summary												
HCM Average Control Delay			13.0			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			59.5			Sum of lost time (s)			13.8			
Intersection Capacity Utilization			36.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

53: Niles St & Beale Ave













5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	202	224	60	39	556	0	0	380	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.9	4.9		4.0	4.9			4.9	
Lane Util. Factor				0.91	0.91		1.00	0.95			0.95	
Frt				1.00	0.97		1.00	1.00			0.99	
Flt Protected				0.95	0.99		0.95	1.00			1.00	
Satd. Flow (prot)				1610	3276		1770	3539			3493	
Flt Permitted				0.95	0.99		0.95	1.00			1.00	
Satd. Flow (perm)				1610	3276		1770	3539			3493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.76	0.76	0.76	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	222	246	66	51	732	0	0	418	40
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	0	0	178	339	0	51	732	0	0	452	0
Turn Type				Perm			Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				13.0	13.0		8.4	25.5			20.6	
Effective Green, g (s)				13.0	13.0		8.4	25.5			20.6	
Actuated g/C Ratio				0.23	0.23		0.15	0.46			0.37	
Clearance Time (s)				4.9	4.9		4.0	4.9			4.9	
Vehicle Extension (s)				2.0	2.0		1.0	2.0			2.0	
Lane Grp Cap (vph)				375	763		266	1617			1290	
v/s Ratio Prot							0.03	c0.21			c0.13	
v/s Ratio Perm				c0.11	0.10							
v/c Ratio				0.47	0.44		0.19	0.45			0.35	
Uniform Delay, d1				18.5	18.3		20.7	10.4			12.8	
Progression Factor				1.00	1.00		0.52	0.51			1.00	
Incremental Delay, d2				0.3	0.2		0.1	0.1			0.1	
Delay (s)				18.8	18.5		10.9	5.3			12.8	
Level of Service				B	B		B	A			B	
Approach Delay (s)		0.0			18.6			5.7			12.8	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM Average Control Delay			11.4									
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			55.8									
Intersection Capacity Utilization			35.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

54: Niles Street & Williams St

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	260	1	0	475	9	0	0	44	0	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.69	0.69	0.69	0.73	0.73	0.73	0.81	0.81	0.81
Hourly flow rate (vph)	0	356	1	0	688	13	0	0	60	0	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		471										
pX, platoon unblocked												
vC, conflicting volume	701			358			701	1058	179	873	1052	351
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	701			358			701	1058	179	873	1052	351
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	98
cM capacity (veh/h)	892			1198			317	223	833	227	225	645
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	237	120	459	243	60	16						
Volume Left	0	0	0	0	0	0						
Volume Right	0	1	0	13	60	16						
cSH	1700	1700	1700	1700	833	645						
Volume to Capacity	0.14	0.07	0.27	0.14	0.07	0.02						
Queue Length 95th (ft)	0	0	0	0	6	2						
Control Delay (s)	0.0	0.0	0.0	0.0	9.7	10.7						
Lane LOS					A	B						
Approach Delay (s)	0.0		0.0		9.7	10.7						
Approach LOS					A	B						
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			23.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

54: Niles Street & Williams St





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	506	2	0	537	20	0	0	41	0	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.85	0.85	0.85	0.68	0.68	0.68
Hourly flow rate (vph)	0	556	2	0	590	22	0	0	48	0	0	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		471										
pX, platoon unblocked												
vC, conflicting volume	612			558			852	1169	279	879	1159	306
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	612			558			852	1169	279	879	1159	306
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	96
cM capacity (veh/h)	963			1009			243	192	718	226	194	690
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	371	188	393	219	48	28						
Volume Left	0	0	0	0	0	0						
Volume Right	0	2	0	22	48	28						
cSH	1700	1700	1700	1700	718	690						
Volume to Capacity	0.22	0.11	0.23	0.13	0.07	0.04						
Queue Length 95th (ft)	0	0	0	0	5	3						
Control Delay (s)	0.0	0.0	0.0	0.0	10.4	10.4						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		10.4	10.4						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			25.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

55: Niles Street & MT Vernon Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	181	97	231	331	89	136	680	34	126	444	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.95		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3354		3433	3427		3433	3982		3433	3947	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3354		3433	3427		3433	3982		3433	3947	
Peak-hour factor, PHF	0.89	0.89	0.89	0.69	0.69	0.69	0.81	0.81	0.81	0.88	0.88	0.88
Adj. Flow (vph)	67	203	109	335	480	129	168	840	42	143	505	60
RTOR Reduction (vph)	0	81	0	0	24	0	0	4	0	0	9	0
Lane Group Flow (vph)	67	231	0	335	585	0	168	878	0	143	556	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.3	13.0		10.5	19.2		7.1	19.1		6.8	18.8	
Effective Green, g (s)	4.3	13.0		10.5	19.2		7.1	19.1		6.8	18.8	
Actuated g/C Ratio	0.06	0.19		0.16	0.28		0.11	0.28		0.10	0.28	
Clearance Time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Vehicle Extension (s)	1.0	2.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	113	645		533	973		361	1125		345	1098	
v/s Ratio Prot	0.04	0.07		c0.10	c0.17		0.05	c0.22		0.04	c0.14	
v/s Ratio Perm												
v/c Ratio	0.59	0.36		0.63	0.60		0.47	0.78		0.41	0.51	
Uniform Delay, d1	30.8	23.7		26.7	20.9		28.5	22.3		28.5	20.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	0.1		1.7	0.7		0.3	3.3		0.3	0.1	
Delay (s)	36.3	23.8		28.4	21.6		28.8	25.6		28.8	20.6	
Level of Service	D	C		C	C		C	C		C	C	
Approach Delay (s)		26.0			24.0			26.1			22.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.6			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			67.6			Sum of lost time (s)			9.1			
Intersection Capacity Utilization			58.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

55: Niles Street & MT Vernon Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	376	130	263	317	114	209	731	60	188	691	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3403		3433	3399		3433	3965		3433	3987	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3403		3433	3399		3433	3965		3433	3987	
Peak-hour factor, PHF	0.89	0.89	0.89	0.94	0.94	0.94	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	96	422	146	280	337	121	232	812	67	227	833	35
RTOR Reduction (vph)	0	37	0	0	37	0	0	7	0	0	3	0
Lane Group Flow (vph)	96	531	0	280	421	0	232	872	0	227	865	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.5	15.8		10.3	19.6		8.5	19.2		8.5	19.2	
Effective Green, g (s)	6.5	15.8		10.3	19.6		8.5	19.2		8.5	19.2	
Actuated g/C Ratio	0.09	0.22		0.14	0.27		0.12	0.27		0.12	0.27	
Clearance Time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Vehicle Extension (s)	1.0	2.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	160	747		491	925		405	1057		405	1063	
v/s Ratio Prot	0.05	c0.16		c0.08	0.12		0.07	c0.22		0.07	c0.22	
v/s Ratio Perm												
v/c Ratio	0.60	0.71		0.57	0.46		0.57	0.83		0.56	0.81	
Uniform Delay, d1	31.5	26.0		28.8	21.8		30.0	24.8		30.0	24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	2.7		1.0	0.1		1.2	5.1		1.1	4.6	
Delay (s)	35.5	28.6		29.8	21.9		31.3	29.9		31.0	29.3	
Level of Service	D	C		C	C		C	C		C	C	
Approach Delay (s)		29.6			24.9			30.2			29.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			28.9			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			72.0			Sum of lost time (s)			21.1			
Intersection Capacity Utilization			66.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

56: 28th ST & M ST













5/24/2011

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Volume (vph)	4	7	11	1	3	29	19	20	3	19	6	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	12	16	12	12
Total Lost time (s)		5.2	5.2				5.2			5.2		
Lane Util. Factor		1.00	1.00				1.00			1.00		
Frt		1.00	0.85				0.96			0.95		
Flt Protected		0.95	1.00				0.98			1.00		
Satd. Flow (prot)		1770	1583				1984			1994		
Flt Permitted		0.95	1.00				0.87			0.97		
Satd. Flow (perm)		1770	1583				1775			1947		
Peak-hour factor, PHF	0.52	0.52	0.52	0.52	0.93	0.93	0.93	0.93	0.60	0.60	0.60	0.60
Adj. Flow (vph)	8	13	21	2	3	31	20	22	5	32	10	13
RTOR Reduction (vph)	0	0	2	0	0	0	10	0	0	7	0	0
Lane Group Flow (vph)	0	21	21	0	0	0	66	0	0	53	0	0
Turn Type	Split		Perm		Perm	Perm			Perm			
Protected Phases	3	3					4			4		
Permitted Phases			3		4	4			4			
Actuated Green, G (s)		3.3	3.3				8.3			8.3		
Effective Green, g (s)		3.3	3.3				8.3			8.3		
Actuated g/C Ratio		0.04	0.04				0.10			0.10		
Clearance Time (s)		5.2	5.2				5.2			5.2		
Vehicle Extension (s)		2.0	2.0				4.5			4.5		
Lane Grp Cap (vph)		68	60				170			187		
v/s Ratio Prot		0.01										
v/s Ratio Perm			c0.01				c0.04			0.03		
v/c Ratio		0.31	0.35				0.39			0.28		
Uniform Delay, d1		40.5	40.6				36.7			36.3		
Progression Factor		1.00	1.00				1.00			1.00		
Incremental Delay, d2		0.9	1.3				2.5			1.4		
Delay (s)		41.4	41.9				39.3			37.8		
Level of Service		D	D				D			D		
Approach Delay (s)		41.7					39.3			37.8		
Approach LOS		D					D			D		
Intersection Summary												
HCM Average Control Delay			14.5				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			86.5				Sum of lost time (s)			21.5		
Intersection Capacity Utilization			62.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

56: 28th ST & M ST



















5/24/2011

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Volume (vph)	24	1082	98	16	25	38	1172	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12
Total Lost time (s)	5.2	5.9				5.2	5.9	
Lane Util. Factor	1.00	0.91				1.00	0.91	
Frt	1.00	0.99				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1770	5012				1770	5081	
Flt Permitted	0.95	1.00				0.95	1.00	
Satd. Flow (perm)	1770	5012				1770	5081	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.81	0.81	0.81	0.81
Adj. Flow (vph)	27	1202	109	18	31	47	1447	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	27	1329	0	0	0	78	1456	0
Turn Type	Prot				Prot	Prot		
Protected Phases	1	6			5	5	2	
Permitted Phases								
Actuated Green, G (s)	3.4	46.4				7.0	50.0	
Effective Green, g (s)	3.4	46.4				7.0	50.0	
Actuated g/C Ratio	0.04	0.54				0.08	0.58	
Clearance Time (s)	5.2	5.9				5.2	5.9	
Vehicle Extension (s)	2.0	3.6				2.0	4.3	
Lane Grp Cap (vph)	70	2689				143	2937	
v/s Ratio Prot	0.02	0.27				c0.04	c0.29	
v/s Ratio Perm								
v/c Ratio	0.39	0.49				0.55	0.50	
Uniform Delay, d1	40.5	12.6				38.2	10.8	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.3	0.2				2.3	0.2	
Delay (s)	41.8	12.8				40.5	11.0	
Level of Service	D	B				D	B	
Approach Delay (s)		13.4					12.5	
Approach LOS		B					B	
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

56: 28th ST & M ST


5/24/2011

												
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	SEL	SET
Lane Configurations												
Volume (vph)	27	7	28	120	16	19	7	28	2	5	19	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	16	12	12	12	12
Total Lost time (s)		5.2	5.2		5.2			5.2			5.2	5.9
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	0.91
Frt		1.00	0.85		0.98			0.98			1.00	1.00
Flt Protected		0.95	1.00		0.96			0.99			0.95	1.00
Satd. Flow (prot)		1770	1583		1999			2050			1770	5066
Flt Permitted		0.95	1.00		0.75			0.94			0.95	1.00
Satd. Flow (perm)		1770	1583		1550			1949			1770	5066
Peak-hour factor, PHF	0.78	0.78	0.78	0.45	0.45	0.45	0.81	0.81	0.81	0.81	0.91	0.91
Adj. Flow (vph)	35	9	36	267	36	42	9	35	2	6	21	1429
RTOR Reduction (vph)	0	0	0	0	3	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	44	36	0	342	0	0	49	0	0	21	1467
Turn Type	Split		Perm	Perm			Perm				Prot	
Protected Phases	3	3			4			4			1	6
Permitted Phases			3	4			4					
Actuated Green, G (s)		6.0	6.0		26.2			26.2			2.5	49.0
Effective Green, g (s)		6.0	6.0		26.2			26.2			2.5	49.0
Actuated g/C Ratio		0.05	0.05		0.24			0.24			0.02	0.45
Clearance Time (s)		5.2	5.2		5.2			5.2			5.2	5.9
Vehicle Extension (s)		2.0	2.0		4.5			4.5			2.0	3.6
Lane Grp Cap (vph)		97	87		371			466			40	2265
v/s Ratio Prot		c0.02									0.01	c0.29
v/s Ratio Perm			0.02		c0.22			0.03				
v/c Ratio		0.45	0.41		0.92			0.11			0.53	0.65
Uniform Delay, d1		50.2	50.1		40.7			32.5			53.0	23.6
Progression Factor		1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2		1.2	1.2		28.5			0.2			5.6	0.7
Delay (s)		51.4	51.3		69.2			32.7			58.6	24.3
Level of Service		D	D		E			C			E	C
Approach Delay (s)		51.4			69.2			32.7				24.8
Approach LOS		D			E			C				C
Intersection Summary												
HCM Average Control Delay			28.7			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			109.6			Sum of lost time (s)			27.4			
Intersection Capacity Utilization			69.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

56: 28th ST & M ST














5/24/2011

						
Movement	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	↑↑↑	↑↑	↑	↑	↑↑↑	↑
Volume (vph)	28	6	38	17	1225	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)				5.2	5.9	
Lane Util. Factor				1.00	0.91	
Frt				1.00	1.00	
Flt Protected				0.95	1.00	
Satd. Flow (prot)				1770	5076	
Flt Permitted				0.95	1.00	
Satd. Flow (perm)				1770	5076	
Peak-hour factor, PHF	0.91	0.91	0.88	0.88	0.88	0.88
Adj. Flow (vph)	31	7	43	19	1392	18
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	62	1409	0
Turn Type			Prot	Prot		
Protected Phases			5	5	2	
Permitted Phases						
Actuated Green, G (s)				6.9	53.4	
Effective Green, g (s)				6.9	53.4	
Actuated g/C Ratio				0.06	0.49	
Clearance Time (s)				5.2	5.9	
Vehicle Extension (s)				2.0	4.3	
Lane Grp Cap (vph)				111	2473	
v/s Ratio Prot				c0.04	c0.28	
v/s Ratio Perm						
v/c Ratio				0.56	0.57	
Uniform Delay, d1				49.9	19.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				3.4	0.4	
Delay (s)				53.3	20.4	
Level of Service				D	C	
Approach Delay (s)					21.7	
Approach LOS					C	
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

57: W Niles St & Union Ave














5/24/2011

								
Movement	WBL2	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	39	472	203	96	49	774	905	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12
Total Lost time (s)		4.1	4.1		3.7	4.4	4.4	
Lane Util. Factor		0.86	0.86		1.00	0.91	0.91	
Frt		1.00	0.97		1.00	1.00	0.99	
Flt Protected		0.95	0.98		0.95	1.00	1.00	
Satd. Flow (prot)		1725	4576		1770	5085	5021	
Flt Permitted		0.95	0.98		0.95	1.00	1.00	
Satd. Flow (perm)		1725	4576		1770	5085	5021	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.81	0.81	0.90	0.90
Adj. Flow (vph)	46	555	239	113	60	956	1006	92
RTOR Reduction (vph)	0	7	29	0	0	0	13	0
Lane Group Flow (vph)	0	294	623	0	60	956	1085	0
Turn Type	Split	Split			Prot			
Protected Phases	8	8	8		5	2	6	
Permitted Phases								
Actuated Green, G (s)		16.6	16.6		3.8	24.2	16.7	
Effective Green, g (s)		16.6	16.6		3.8	24.2	16.7	
Actuated g/C Ratio		0.34	0.34		0.08	0.49	0.34	
Clearance Time (s)		4.1	4.1		3.7	4.4	4.4	
Vehicle Extension (s)		3.0	3.0		2.0	0.2	0.2	
Lane Grp Cap (vph)		581	1541		136	2496	1701	
v/s Ratio Prot		c0.17	0.14		0.03	c0.19	c0.22	
v/s Ratio Perm								
v/c Ratio		0.51	0.40		0.44	0.38	0.64	
Uniform Delay, d1		13.1	12.6		21.7	7.9	13.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.7	0.2		0.8	0.0	0.6	
Delay (s)		13.8	12.7		22.6	7.9	14.3	
Level of Service		B	B		C	A	B	
Approach Delay (s)			13.1			8.8	14.3	
Approach LOS			B			A	B	
Intersection Summary								
HCM Average Control Delay			12.1		HCM Level of Service		B	
HCM Volume to Capacity ratio			0.58					
Actuated Cycle Length (s)			49.3		Sum of lost time (s)		12.9	
Intersection Capacity Utilization			47.8%		ICU Level of Service		A	
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

57: W Niles St & Union Ave





















5/24/2011

								
Movement	WBL2	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	20	254	359	242	99	854	784	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12
Total Lost time (s)		4.1	4.1		3.7	4.4	4.4	
Lane Util. Factor		0.86	0.86		1.00	0.91	0.91	
Frt		1.00	0.94		1.00	1.00	0.97	
Flt Protected		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1725	4521		1770	5085	4958	
Flt Permitted		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1725	4521		1770	5085	4958	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.91	0.91	0.97	0.97
Adj. Flow (vph)	22	282	399	269	109	938	808	162
RTOR Reduction (vph)	0	3	109	0	0	0	36	0
Lane Group Flow (vph)	0	245	615	0	109	938	934	0
Turn Type	Split	Split			Prot			
Protected Phases	8	8	8		5	2	6	
Permitted Phases								
Actuated Green, G (s)		16.0	16.0		6.4	25.9	15.8	
Effective Green, g (s)		16.0	16.0		6.4	25.9	15.8	
Actuated g/C Ratio		0.32	0.32		0.13	0.51	0.31	
Clearance Time (s)		4.1	4.1		3.7	4.4	4.4	
Vehicle Extension (s)		3.0	3.0		2.0	0.2	0.2	
Lane Grp Cap (vph)		548	1435		225	2613	1554	
v/s Ratio Prot		c0.14	0.14		c0.06	0.18	c0.19	
v/s Ratio Perm								
v/c Ratio		0.45	0.43		0.48	0.36	0.60	
Uniform Delay, d1		13.7	13.6		20.5	7.3	14.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.6	0.2		0.6	0.0	0.5	
Delay (s)		14.3	13.8		21.1	7.3	15.1	
Level of Service		B	B		C	A	B	
Approach Delay (s)			13.9			8.8	15.1	
Approach LOS			B			A	B	
Intersection Summary								
HCM Average Control Delay			12.5		HCM Level of Service		B	
HCM Volume to Capacity ratio			0.52					
Actuated Cycle Length (s)			50.4		Sum of lost time (s)		12.2	
Intersection Capacity Utilization			48.0%		ICU Level of Service		A	
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

58: 30th St & F St





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	89	19	111	78	51	36	181	62	101	453	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.94		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1814		1770	1753		1770	3404		1770	3466	
Flt Permitted	0.65	1.00		0.67	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1210	1814		1252	1753		1770	3404		1770	3466	
Peak-hour factor, PHF	0.81	0.81	0.81	0.76	0.76	0.76	0.85	0.85	0.85	0.76	0.76	0.76
Adj. Flow (vph)	38	110	23	146	103	67	42	213	73	133	596	96
RTOR Reduction (vph)	0	7	0	0	21	0	0	31	0	0	10	0
Lane Group Flow (vph)	38	126	0	146	149	0	42	255	0	133	682	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)	10.8	10.8		10.8	10.8		2.0	14.5		6.3	18.8	
Effective Green, g (s)	10.8	10.8		10.8	10.8		2.0	14.5		6.3	18.8	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.04	0.32		0.14	0.42	
Clearance Time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	288	432		298	418		78	1090		246	1438	
v/s Ratio Prot		0.07			0.08		c0.02	0.08		0.08	c0.20	
v/s Ratio Perm	0.03			c0.12								
v/c Ratio	0.13	0.29		0.49	0.36		0.54	0.23		0.54	0.47	
Uniform Delay, d1	13.6	14.1		14.9	14.4		21.2	11.3		18.2	9.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.5	0.2		3.5	0.0		1.3	0.1	
Delay (s)	13.6	14.3		15.3	14.5		24.7	11.4		19.5	9.7	
Level of Service	B	B		B	B		C	B		B	A	
Approach Delay (s)		14.1			14.9			13.1			11.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			12.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			45.3			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			46.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

58: 30th St & F St





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	105	52	118	109	109	42	444	77	109	372	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.93		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1770		1770	1723		1770	3461		1770	3459	
Flt Permitted	0.57	1.00		0.50	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1061	1770		940	1723		1770	3461		1770	3459	
Peak-hour factor, PHF	0.54	0.54	0.54	0.89	0.89	0.89	0.80	0.80	0.80	0.86	0.86	0.86
Adj. Flow (vph)	178	194	96	133	122	122	52	555	96	127	433	77
RTOR Reduction (vph)	0	14	0	0	28	0	0	13	0	0	13	0
Lane Group Flow (vph)	178	276	0	133	216	0	52	638	0	127	497	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)	19.9	19.9		19.9	19.9		7.4	19.6		7.1	19.3	
Effective Green, g (s)	19.9	19.9		19.9	19.9		7.4	19.6		7.1	19.3	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.12	0.33		0.12	0.32	
Clearance Time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	350	584		310	569		217	1125		208	1107	
v/s Ratio Prot		0.16			0.13		0.03	c0.18		c0.07	0.14	
v/s Ratio Perm	c0.17			0.14								
v/c Ratio	0.51	0.47		0.43	0.38		0.24	0.57		0.61	0.45	
Uniform Delay, d1	16.3	16.0		15.8	15.5		23.9	16.8		25.3	16.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.3	0.2		0.2	0.4		3.7	0.1	
Delay (s)	16.7	16.3		16.1	15.6		24.1	17.2		29.0	16.4	
Level of Service	B	B		B	B		C	B		C	B	
Approach Delay (s)		16.4			15.8			17.7			18.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			17.5			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			60.3			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			54.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

59: Flower St & Beale Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	128	38	89	106	232	31	197	129	75	356	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.90		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1799		1770	1671		1770	3329		1770	3466	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1799		1770	1671		1770	3329		1770	3466	
Peak-hour factor, PHF	0.73	0.73	0.73	0.81	0.81	0.81	0.80	0.80	0.80	0.79	0.79	0.79
Adj. Flow (vph)	8	175	52	110	131	286	39	246	161	95	451	72
RTOR Reduction (vph)	0	18	0	0	125	0	0	119	0	0	18	0
Lane Group Flow (vph)	8	209	0	110	292	0	39	288	0	95	505	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.6	14.1		3.8	17.3		1.3	13.7		4.3	16.7	
Effective Green, g (s)	0.6	14.1		3.8	17.3		1.3	13.7		4.3	16.7	
Actuated g/C Ratio	0.01	0.27		0.07	0.33		0.03	0.26		0.08	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	20	489		130	557		44	879		147	1115	
v/s Ratio Prot	0.00	0.12		c0.06	c0.17		0.02	0.09		c0.05	c0.15	
v/s Ratio Perm												
v/c Ratio	0.40	0.43		0.85	0.52		0.89	0.33		0.65	0.45	
Uniform Delay, d1	25.5	15.6		23.8	14.0		25.2	15.4		23.1	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.6	0.6		36.9	0.9		92.1	0.2		9.4	0.3	
Delay (s)	38.1	16.2		60.7	14.9		117.3	15.6		32.4	14.3	
Level of Service	D	B		E	B		F	B		C	B	
Approach Delay (s)		16.9			24.4			24.5			17.1	
Approach LOS		B			C			C			B	
Intersection Summary												
HCM Average Control Delay			21.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			51.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			51.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

59: Flower St & Beale Ave























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	152	26	116	99	286	28	349	229	71	268	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.89		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1822		1770	1655		1770	3329		1770	3486	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1822		1770	1655		1770	3329		1770	3486	
Peak-hour factor, PHF	0.79	0.79	0.79	0.86	0.86	0.86	0.94	0.94	0.94	0.77	0.77	0.77
Adj. Flow (vph)	18	192	33	135	115	333	30	371	244	92	348	39
RTOR Reduction (vph)	0	10	0	0	159	0	0	171	0	0	12	0
Lane Group Flow (vph)	18	215	0	135	289	0	30	444	0	92	375	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.6	15.3		5.2	19.9		1.4	15.0		4.1	17.7	
Effective Green, g (s)	0.6	15.3		5.2	19.9		1.4	15.0		4.1	17.7	
Actuated g/C Ratio	0.01	0.28		0.09	0.36		0.03	0.27		0.07	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	19	501		166	592		45	898		131	1110	
v/s Ratio Prot	0.01	0.12		c0.08	c0.17		0.02	c0.13		c0.05	c0.11	
v/s Ratio Perm												
v/c Ratio	0.95	0.43		0.81	0.49		0.67	0.49		0.70	0.34	
Uniform Delay, d1	27.5	16.6		24.7	13.9		26.9	17.1		25.2	14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	179.6	0.6		25.3	0.6		31.5	0.4		15.7	0.2	
Delay (s)	207.1	17.2		50.0	14.5		58.3	17.5		40.8	14.7	
Level of Service	F	B		D	B		E	B		D	B	
Approach Delay (s)		31.2			22.7			19.4			19.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			22.0			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			55.6			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			60.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

60: F ST & Golden State Ave























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	162	11	42	10	14	21	33	1343	575	126	1133	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1696	1583		1726		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1696	1583		1726		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.87	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	176	12	46	11	16	24	39	1580	676	143	1288	15
RTOR Reduction (vph)	0	0	41	0	23	0	0	0	150	0	0	2
Lane Group Flow (vph)	93	95	5	0	28	0	39	1580	526	143	1288	13
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7						6			2
Actuated Green, G (s)	13.5	13.5	13.5		6.8		6.0	61.5	61.5	13.7	69.2	69.2
Effective Green, g (s)	13.5	13.5	13.5		6.8		6.0	61.5	61.5	13.7	69.2	69.2
Actuated g/C Ratio	0.12	0.12	0.12		0.06		0.05	0.53	0.53	0.12	0.60	0.60
Clearance Time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Vehicle Extension (s)	4.5	4.5	4.5		3.0		2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	196	198	185		102		92	1883	842	210	2119	948
v/s Ratio Prot	0.06	c0.06			c0.02		0.02	c0.45		c0.08	0.36	
v/s Ratio Perm			0.00						0.33			0.01
v/c Ratio	0.47	0.48	0.03		0.28		0.42	0.84	0.62	0.68	0.61	0.01
Uniform Delay, d1	47.7	47.8	45.2		52.1		53.1	22.9	19.0	48.9	14.6	9.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	3.1	0.1		1.5		1.1	3.8	2.0	7.0	0.7	0.0
Delay (s)	50.8	50.9	45.4		53.5		54.3	26.7	21.0	55.9	15.4	9.4
Level of Service	D	D	D		D		D	C	C	E	B	A
Approach Delay (s)		49.8			53.5			25.5			19.3	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM Average Control Delay			25.0			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			115.6			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			67.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

60: F ST & Golden State Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	515	20	87	24	23	25	17	1221	310	149	1481	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00	1.00	0.95	1.00
Fr't	1.00	1.00	0.85		0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1691	1583		1747		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1691	1583		1747		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.64	0.64	0.64	0.93	0.93	0.93	0.86	0.86	0.86
Adj. Flow (vph)	592	23	100	38	36	39	18	1313	333	173	1722	6
RTOR Reduction (vph)	0	0	78	0	14	0	0	0	104	0	0	0
Lane Group Flow (vph)	308	307	22	0	99	0	18	1313	229	173	1722	6
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7						6			2
Actuated Green, G (s)	24.6	24.6	24.6		13.1		2.8	62.4	62.4	17.5	77.1	77.1
Effective Green, g (s)	24.6	24.6	24.6		13.1		2.8	62.4	62.4	17.5	77.1	77.1
Actuated g/C Ratio	0.18	0.18	0.18		0.10		0.02	0.45	0.45	0.13	0.56	0.56
Clearance Time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Vehicle Extension (s)	4.5	4.5	4.5		3.0		2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	300	302	283		166		36	1604	717	225	1982	886
v/s Ratio Prot	c0.18	0.18			c0.06		0.01	0.37		c0.10	c0.49	
v/s Ratio Perm			0.01						0.14			0.00
v/c Ratio	1.03	1.02	0.08		0.60		0.50	0.82	0.32	0.77	0.87	0.01
Uniform Delay, d1	56.5	56.5	47.1		59.8		66.8	32.7	24.1	58.1	26.0	13.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	59.0	56.1	0.2		5.7		3.9	3.8	0.5	13.2	4.7	0.0
Delay (s)	115.5	112.6	47.3		65.5		70.7	36.5	24.6	71.4	30.7	13.4
Level of Service	F	F	D		E		E	D	C	E	C	B
Approach Delay (s)		104.7			65.5			34.5			34.3	
Approach LOS		F			E			C			C	
Intersection Summary												
HCM Average Control Delay			46.7									
HCM Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			137.7							20.1		
Intersection Capacity Utilization			79.7%							D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

61: Jefferson St & Beale Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	215	0	52	0	273	0	0	102	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.45	0.45	0.45
Hourly flow rate (vph)	0	0	0	253	0	61	0	314	0	0	227	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								857				
pX, platoon unblocked												
vC, conflicting volume	445	540	113	427	540	157	227			314		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	445	540	113	427	540	157	227			314		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	51	100	93	100			100		
cM capacity (veh/h)	462	447	918	511	447	861	1339			1243		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total	169	145	157	157	151	76						
Volume Left	169	84	0	0	0	0						
Volume Right	0	61	0	0	0	0						
cSH	511	617	1700	1700	1700	1700						
Volume to Capacity	0.33	0.24	0.09	0.09	0.09	0.04						
Queue Length 95th (ft)	36	23	0	0	0	0						
Control Delay (s)	15.5	12.6	0.0	0.0	0.0	0.0						
Lane LOS	C	B										
Approach Delay (s)	14.2		0.0		0.0							
Approach LOS	B											
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			21.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

61: Jefferson St & Beale Ave























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	88	4	42	0	516	0	0	174	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.63	0.63	0.83	0.83	0.83	0.89	0.89	0.89	0.69	0.69	0.69
Hourly flow rate (vph)	0	0	0	106	5	51	0	580	0	0	252	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								857				
pX, platoon unblocked												
vC, conflicting volume	598	835	129	706	838	290	258			580		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	598	835	129	706	838	290	258			580		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	67	98	93	100			100		
cM capacity (veh/h)	354	302	897	323	301	707	1304			990		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total	71	91	290	290	168	90						
Volume Left	71	35	0	0	0	0						
Volume Right	0	51	0	0	0	6						
cSH	323	461	1700	1700	1700	1700						
Volume to Capacity	0.22	0.20	0.17	0.17	0.10	0.05						
Queue Length 95th (ft)	20	18	0	0	0	0						
Control Delay (s)	19.2	14.7	0.0	0.0	0.0	0.0						
Lane LOS	C	B										
Approach Delay (s)	16.7		0.0		0.0							
Approach LOS	C											
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			24.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

62: Parking Lot & Chester Ave























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	8	304	1	39	31	432	481	100	703	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Fr _t		0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1643		1681	1686	1583	1770	3539	1583	1770	3538	
Flt Permitted		1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1643		1681	1686	1583	1770	3539	1583	1770	3538	
Peak-hour factor, PHF	0.38	0.38	0.38	0.78	0.78	0.78	0.85	0.85	0.85	0.69	0.69	0.69
Adj. Flow (vph)	0	3	21	390	1	50	36	508	566	145	1019	3
RTOR Reduction (vph)	0	20	0	0	0	40	0	0	368	0	0	0
Lane Group Flow (vph)	0	4	0	195	196	10	36	508	198	145	1022	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			
Actuated Green, G (s)		1.8		14.2	14.2	14.2	3.1	24.4	24.4	10.8	32.1	
Effective Green, g (s)		1.8		14.2	14.2	14.2	3.1	24.4	24.4	10.8	32.1	
Actuated g/C Ratio		0.03		0.20	0.20	0.20	0.04	0.35	0.35	0.15	0.46	
Clearance Time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)		2.0		1.5	1.5	1.5	1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)		42		342	343	323	79	1239	554	274	1629	
v/s Ratio Prot		c0.00		0.12	c0.12		0.02	0.14		c0.08	c0.29	
v/s Ratio Perm						0.01			0.13			
v/c Ratio		0.08		0.57	0.57	0.03	0.46	0.41	0.36	0.53	0.63	
Uniform Delay, d1		33.1		25.0	25.0	22.2	32.5	17.2	16.8	27.1	14.3	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		1.4	1.4	0.0	1.5	0.1	0.1	0.9	0.5	
Delay (s)		33.5		26.4	26.4	22.3	34.0	17.3	17.0	28.0	14.8	
Level of Service		C		C	C	C	C	B	B	C	B	
Approach Delay (s)		33.5			26.0			17.7			16.4	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			18.6									
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			69.7									
Intersection Capacity Utilization			50.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

62: Parking Lot & Chester Ave
























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	8	24	528	4	69	21	689	234	62	520	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1691		1681	1687	1583	1770	3539	1583	1770	3535	
Flt Permitted		0.99		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1691		1681	1687	1583	1770	3539	1583	1770	3535	
Peak-hour factor, PHF	0.79	0.79	0.79	0.83	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.84
Adj. Flow (vph)	8	10	30	636	5	83	25	830	282	74	619	5
RTOR Reduction (vph)	0	28	0	0	0	56	0	0	120	0	1	0
Lane Group Flow (vph)	0	20	0	318	323	27	25	830	162	74	623	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			
Actuated Green, G (s)		4.6		26.9	26.9	26.9	2.1	28.3	28.3	6.2	32.4	
Effective Green, g (s)		4.6		26.9	26.9	26.9	2.1	28.3	28.3	6.2	32.4	
Actuated g/C Ratio		0.05		0.32	0.32	0.32	0.02	0.33	0.33	0.07	0.38	
Clearance Time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)		2.0		1.5	1.5	1.5	1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)		92		535	537	504	44	1185	530	130	1355	
v/s Ratio Prot		c0.01		0.19	c0.19		0.01	c0.23		c0.04	0.18	
v/s Ratio Perm						0.02			0.10			
v/c Ratio		0.21		0.59	0.60	0.05	0.57	0.70	0.30	0.57	0.46	
Uniform Delay, d1		38.2		24.2	24.3	20.0	40.8	24.4	20.8	37.9	19.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4		1.2	1.3	0.0	9.6	1.5	0.1	3.4	0.1	
Delay (s)		38.6		25.4	25.6	20.0	50.4	26.0	20.9	41.2	19.6	
Level of Service		D		C	C	B	D	C	C	D	B	
Approach Delay (s)		38.6			24.9			25.3			21.9	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.5									
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			84.5									
Intersection Capacity Utilization			55.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

63: 34th ST & Union Ave
























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	109	108	95	155	39	355	674	73	87	759	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	5011		1770	5037	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	5011		1770	5037	
Peak-hour factor, PHF	0.93	0.93	0.93	0.66	0.66	0.66	0.71	0.71	0.71	0.69	0.69	0.69
Adj. Flow (vph)	40	117	116	144	235	59	500	949	103	126	1100	75
RTOR Reduction (vph)	0	0	98	0	0	46	0	7	0	0	4	0
Lane Group Flow (vph)	40	117	18	144	235	13	500	1045	0	126	1171	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.1	18.0	18.0	13.9	26.4	26.4	26.1	55.4		12.8	42.1	
Effective Green, g (s)	6.1	18.0	18.0	13.9	26.4	26.4	26.1	55.4		12.8	42.1	
Actuated g/C Ratio	0.05	0.15	0.15	0.12	0.23	0.23	0.22	0.47		0.11	0.36	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	2.5	2.5	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	92	543	243	210	797	356	394	2367		193	1808	
v/s Ratio Prot	0.02	0.03		c0.08	c0.07		c0.28	0.21		0.07	c0.23	
v/s Ratio Perm			0.01			0.01						
v/c Ratio	0.43	0.22	0.07	0.69	0.29	0.04	1.27	0.44		0.65	0.65	
Uniform Delay, d1	53.9	43.5	42.5	49.6	37.7	35.5	45.6	20.6		50.1	31.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.4	0.3	7.2	0.2	0.0	139.7	0.3		5.9	1.1	
Delay (s)	55.1	43.9	42.8	56.8	37.9	35.6	185.3	20.9		56.0	32.5	
Level of Service	E	D	D	E	D	D	F	C		E	C	
Approach Delay (s)		45.1			43.8			73.9			34.8	
Approach LOS		D			D			E			C	
Intersection Summary												
HCM Average Control Delay			53.7				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			117.3				Sum of lost time (s)		12.6			
Intersection Capacity Utilization			69.3%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

63: 34th ST & Union Ave














5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	239	257	162	125	72	149	682	155	101	488	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4944		1770	5042	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4944		1770	5042	
Peak-hour factor, PHF	0.71	0.71	0.71	0.92	0.92	0.92	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	125	337	362	176	136	78	155	710	161	107	519	31
RTOR Reduction (vph)	0	0	278	0	0	57	0	24	0	0	4	0
Lane Group Flow (vph)	125	337	84	176	136	21	155	847	0	107	546	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.2	22.6	22.6	15.1	26.1	26.1	13.9	30.9		11.1	28.1	
Effective Green, g (s)	12.2	22.6	22.6	15.1	26.1	26.1	13.9	30.9		11.1	28.1	
Actuated g/C Ratio	0.13	0.23	0.23	0.16	0.27	0.27	0.14	0.32		0.11	0.29	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	2.5	2.5	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	223	825	369	276	953	426	254	1577		203	1462	
v/s Ratio Prot	0.07	c0.10		c0.10	c0.04		c0.09	c0.17		0.06	0.11	
v/s Ratio Perm			0.05			0.01						
v/c Ratio	0.56	0.41	0.23	0.64	0.14	0.05	0.61	0.54		0.53	0.37	
Uniform Delay, d1	39.8	31.5	30.1	38.3	26.9	26.2	39.0	27.1		40.4	27.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.7	0.7	3.5	0.1	0.0	3.0	0.6		1.1	0.3	
Delay (s)	41.7	32.2	30.8	41.9	26.9	26.2	42.0	27.8		41.6	27.7	
Level of Service	D	C	C	D	C	C	D	C		D	C	
Approach Delay (s)		33.0			33.5			29.9			30.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			31.3				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			96.9				Sum of lost time (s)		21.2			
Intersection Capacity Utilization			59.9%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

64: Columbus St & Chester Ave














5/24/2011

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	242	131	0	241	146	189	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0	4.0
Lane Util. Factor	0.97	0.91		0.95		1.00	0.95
Frt	0.99	0.85		0.94		1.00	1.00
Flt Protected	0.96	1.00		1.00		0.95	1.00
Satd. Flow (prot)	3420	1441		3339		1770	3539
Flt Permitted	0.96	1.00		1.00		0.50	1.00
Satd. Flow (perm)	3420	1441		3339		930	3539
Peak-hour factor, PHF	0.78	0.78	0.89	0.89	0.89	0.88	0.88
Adj. Flow (vph)	310	168	0	271	164	215	602
RTOR Reduction (vph)	11	106	0	88	0	0	0
Lane Group Flow (vph)	319	42	0	347	0	215	602
Turn Type		Perm	Perm			Perm	
Protected Phases	8			2			6
Permitted Phases		8	2			6	
Actuated Green, G (s)	8.9	8.9		14.7		14.7	14.7
Effective Green, g (s)	8.9	8.9		14.7		14.7	14.7
Actuated g/C Ratio	0.28	0.28		0.47		0.47	0.47
Clearance Time (s)	4.0	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	963	406		1553		433	1646
v/s Ratio Prot	c0.09			0.10			0.17
v/s Ratio Perm		0.03				c0.23	
v/c Ratio	0.33	0.10		0.22		0.50	0.37
Uniform Delay, d1	9.0	8.4		5.0		5.9	5.4
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.2	0.1		0.1		0.9	0.1
Delay (s)	9.2	8.5		5.1		6.8	5.6
Level of Service	A	A		A		A	A
Approach Delay (s)	9.0			5.1			5.9
Approach LOS	A			A			A
Intersection Summary							
HCM Average Control Delay			6.6		HCM Level of Service		A
HCM Volume to Capacity ratio			0.43				
Actuated Cycle Length (s)			31.6		Sum of lost time (s)		8.0
Intersection Capacity Utilization			40.1%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

64: Columbus St & Chester Ave





















5/24/2011

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	146	274	0	561	180	232	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0	4.0
Lane Util. Factor	0.97	0.91		0.95		1.00	0.95
Frt	0.93	0.85		0.96		1.00	1.00
Flt Protected	0.97	1.00		1.00		0.95	1.00
Satd. Flow (prot)	3267	1441		3410		1770	3539
Flt Permitted	0.97	1.00		1.00		0.24	1.00
Satd. Flow (perm)	3267	1441		3410		445	3539
Peak-hour factor, PHF	0.84	0.84	0.71	0.71	0.71	0.96	0.96
Adj. Flow (vph)	174	326	0	790	254	242	425
RTOR Reduction (vph)	87	87	0	41	0	0	0
Lane Group Flow (vph)	250	76	0	1003	0	242	425
Turn Type		Perm	Perm			Perm	
Protected Phases	8			2			6
Permitted Phases		8	2			6	
Actuated Green, G (s)	8.5	8.5		25.1		25.1	25.1
Effective Green, g (s)	8.5	8.5		25.1		25.1	25.1
Actuated g/C Ratio	0.20	0.20		0.60		0.60	0.60
Clearance Time (s)	4.0	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	668	294		2057		268	2135
v/s Ratio Prot	c0.08			0.29			0.12
v/s Ratio Perm		0.05				c0.54	
v/c Ratio	0.37	0.26		0.49		0.90	0.20
Uniform Delay, d1	14.3	13.9		4.6		7.2	3.7
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.4	0.5		0.2		30.8	0.0
Delay (s)	14.6	14.4		4.8		38.0	3.8
Level of Service	B	B		A		D	A
Approach Delay (s)	14.5			4.8			16.2
Approach LOS	B			A			B
Intersection Summary							
HCM Average Control Delay		10.4		HCM Level of Service		B	
HCM Volume to Capacity ratio		0.77					
Actuated Cycle Length (s)		41.6		Sum of lost time (s)		8.0	
Intersection Capacity Utilization		51.2%		ICU Level of Service		A	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

65: Columbus Street & Union Ave





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	117	66	241	235	120	103	503	129	159	561	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frt	1.00	0.95		1.00	0.95		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3348		1770	3360		1770	4929		1770	4954	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3348		1770	3360		1770	4929		1770	4954	
Peak-hour factor, PHF	0.73	0.73	0.73	0.74	0.74	0.74	0.67	0.67	0.67	0.76	0.76	0.76
Adj. Flow (vph)	145	160	90	326	318	162	154	751	193	209	738	153
RTOR Reduction (vph)	0	77	0	0	68	0	0	44	0	0	30	0
Lane Group Flow (vph)	145	173	0	326	412	0	154	900	0	209	861	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.7	11.6		18.3	18.2		10.7	22.6		11.2	23.1	
Effective Green, g (s)	11.7	11.6		18.3	18.2		10.7	22.6		11.2	23.1	
Actuated g/C Ratio	0.15	0.15		0.23	0.23		0.13	0.28		0.14	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	260	487		406	767		238	1398		249	1436	
v/s Ratio Prot	0.08	0.05		c0.18	c0.12		0.09	c0.18		c0.12	0.17	
v/s Ratio Perm												
v/c Ratio	0.56	0.36		0.80	0.54		0.65	0.64		0.84	0.60	
Uniform Delay, d1	31.6	30.7		29.0	27.0		32.7	25.0		33.4	24.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.4		10.9	0.7		5.9	1.0		21.3	0.7	
Delay (s)	34.2	31.1		39.9	27.8		38.6	26.1		54.6	25.0	
Level of Service	C	C		D	C		D	C		D	C	
Approach Delay (s)		32.2			32.7			27.8			30.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			30.4			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			79.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			53.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis













65: Columbus Street & Union Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	205	108	82	140	82	121	549	92	152	365	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frt	1.00	0.95		1.00	0.94		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3356		1770	3343		1770	4976		1770	4975	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3356		1770	3343		1770	4976		1770	4975	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.82	0.82	0.82	0.50	0.50	0.50
Adj. Flow (vph)	160	247	130	99	169	99	148	670	112	304	730	124
RTOR Reduction (vph)	0	73	0	0	84	0	0	22	0	0	22	0
Lane Group Flow (vph)	160	304	0	99	184	0	148	760	0	304	832	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.6	14.4		7.9	10.7		10.5	19.0		11.3	19.8	
Effective Green, g (s)	11.6	14.4		7.9	10.7		10.5	19.0		11.3	19.8	
Actuated g/C Ratio	0.17	0.21		0.12	0.16		0.15	0.28		0.16	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	299	704		204	521		271	1378		292	1436	
v/s Ratio Prot	c0.09	c0.09		0.06	0.06		0.08	0.15		c0.17	c0.17	
v/s Ratio Perm												
v/c Ratio	0.54	0.43		0.49	0.35		0.55	0.55		1.04	0.58	
Uniform Delay, d1	26.0	23.5		28.4	25.9		26.8	21.2		28.6	20.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.4		1.8	0.4		2.2	0.5		63.8	0.6	
Delay (s)	27.9	24.0		30.3	26.3		29.1	21.6		92.4	21.4	
Level of Service	C	C		C	C		C	C		F	C	
Approach Delay (s)		25.1			27.4			22.8			40.1	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			30.5			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			68.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			48.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												













HCM Unsignalized Intersection Capacity Analysis 66: 30Th St & Chester Ave

5/24/2011


												
Movement	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL
Right Turn Channelized												
Volume (veh/h)	18	97	90	42	23	46	21	78	58	86	37	45
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.84	0.84	0.84	0.84	0.84	0.87	0.87
Hourly flow rate (vph)	22	120	111	52	28	55	25	93	69	102	43	52
Approach Volume (veh/h)			333					344				
Crossing Volume (veh/h)			934					909				
High Capacity (veh/h)			657					670				
High v/c (veh/h)			0.51					0.51				
Low Capacity (veh/h)			513					524				
Low v/c (veh/h)			0.65					0.66				

Intersection Summary

Maximum v/c High	0.83
Maximum v/c Low	1.01
Intersection Capacity Utilization	109.3%
ICU Level of Service	H

												
Movement	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	SEL2	SEL	SET	SER
Right Turn Channelized												
Volume (veh/h)	352	53	5	11	48	377	231	182	239	37	6	82
Peak Hour Factor	0.87	0.87	0.87	0.98	0.98	0.98	0.98	0.98	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	405	61	6	11	49	385	236	186	269	42	7	92
Approach Volume (veh/h)	566					866					413	
Crossing Volume (veh/h)	737					358					896	
High Capacity (veh/h)	772					1045					678	
High v/c (veh/h)	0.73					0.83					0.61	
Low Capacity (veh/h)	612					854					530	
Low v/c (veh/h)	0.92					1.01					0.78	













Intersection Summary

	
Movement	SER2
Right Turn Channelized	
Volume (veh/h)	4
Peak Hour Factor	0.89
Hourly flow rate (vph)	4
Approach Volume (veh/h)	
Crossing Volume (veh/h)	
High Capacity (veh/h)	
High v/c (veh/h)	
Low Capacity (veh/h)	
Low v/c (veh/h)	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis 66: 30Th St & Chester Ave

5/24/2011













												
Movement	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL
Right Turn Channelized												
Volume (veh/h)	50	150	68	51	27	48	35	104	52	109	73	118
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	53	158	72	54	28	56	41	121	60	127	79	128
Approach Volume (veh/h)			364					405				
Crossing Volume (veh/h)			1177					1144				
High Capacity (veh/h)			538					553				
High v/c (veh/h)			0.68					0.73				
Low Capacity (veh/h)			410					423				
Low v/c (veh/h)			0.89					0.96				

Intersection Summary


Maximum v/c High	1.48
Maximum v/c Low	1.84
Intersection Capacity Utilization	Err%
# Crossing flow exceeds 1200, method is not applicable	

ICU Level of Service

H

												
Movement	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	SEL2	SEL	SET	SER
Right Turn Channelized												
Volume (veh/h)	479	44	11	10	63	559	253	311	197	20	3	136
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.89	0.89	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	521	48	12	11	71	628	284	349	205	21	3	142
Approach Volume (veh/h)	788					1344						523
Crossing Volume (veh/h)	703					538					1291#	
High Capacity (veh/h)	793					905					489	
High v/c (veh/h)	0.99					1.48					1.07	
Low Capacity (veh/h)	631					730					370	
Low v/c (veh/h)	1.25					1.84					1.41	

Intersection Summary





















	
Movement	SER2
Right Turn Channelized	
Volume (veh/h)	146
Peak Hour Factor	0.96
Hourly flow rate (vph)	152
Approach Volume (veh/h)	
Crossing Volume (veh/h)	
High Capacity (veh/h)	
High v/c (veh/h)	
Low Capacity (veh/h)	
Low v/c (veh/h)	

Intersection Summary

HCM Signalized Intersection Capacity Analysis

67: California Ave & L St





















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	939	11	18	526	14	7	5	3	17	12	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5076		1770	5065		1770	1761		1770	1686	
Flt Permitted	0.43	1.00		0.24	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	792	5076		446	5065		1863	1761		1863	1686	
Peak-hour factor, PHF	0.69	0.69	0.69	0.94	0.94	0.94	0.75	0.75	0.75	0.65	0.65	0.65
Adj. Flow (vph)	48	1361	16	19	560	15	9	7	4	26	18	31
RTOR Reduction (vph)	0	2	0	0	4	0	0	4	0	0	29	C
Lane Group Flow (vph)	48	1375	0	19	571	0	9	7	0	26	20	C
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.7	16.7		16.7	16.7		2.0	2.0		2.0	2.0	
Effective Green, g (s)	16.7	16.7		16.7	16.7		2.0	2.0		2.0	2.0	
Actuated g/C Ratio	0.63	0.63		0.63	0.63		0.07	0.07		0.07	0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	495	3175		279	3168		140	132		140	126	
v/s Ratio Prot		c0.27			0.11			0.00			0.01	
v/s Ratio Perm	0.06			0.04			0.00			c0.01		
v/c Ratio	0.10	0.43		0.07	0.18		0.06	0.06		0.19	0.16	
Uniform Delay, d1	2.0	2.6		2.0	2.1		11.5	11.5		11.6	11.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.0		0.2	0.2		0.6	0.6	
Delay (s)	2.1	2.7		2.1	2.1		11.7	11.6		12.2	12.2	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		2.6			2.1			11.7			12.2	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			2.9			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			26.7			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			39.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

67: California Ave & L St























5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	915	12	18	1236	24	8	40	14	15	23	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5075		1770	5071		1770	1791		1770	1704	
Flt Permitted	0.22	1.00		0.27	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	403	5075		507	5071		1863	1791		1863	1704	
Peak-hour factor, PHF	0.92	0.92	0.92	0.72	0.72	0.72	0.82	0.82	0.82	0.89	0.89	0.89
Adj. Flow (vph)	67	995	13	25	1717	33	10	49	17	17	26	34
RTOR Reduction (vph)	0	2	0	0	3	0	0	16	0	0	3	0
Lane Group Flow (vph)	67	1006	0	25	1747	0	10	50	0	17	57	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.5	18.5		18.5	18.5		2.4	2.4		2.4	2.4	
Effective Green, g (s)	18.5	18.5		18.5	18.5		2.4	2.4		2.4	2.4	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.08	0.08		0.08	0.08	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	258	3249		325	3246		155	149		155	142	
v/s Ratio Prot		0.20			c0.34			0.03			c0.03	
v/s Ratio Perm	0.17			0.05			0.01			0.01		
v/c Ratio	0.26	0.31		0.08	0.54		0.06	0.34		0.11	0.40	
Uniform Delay, d1	2.2	2.3		2.0	2.9		12.2	12.5		12.3	12.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		0.1	0.2		0.2	1.4		0.3	1.9	
Delay (s)	2.8	2.4		2.1	3.0		12.4	13.9		12.6	14.4	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		2.4			3.0			13.7			14.0	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			3.4			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			28.9			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			45.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Hayden Ct & Union Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	0	2	133	0	18	11	1320	104	154	896	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1794		1681	1905	1583	1770	5030		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1794		1681	1905	1583	1770	5030		1770	5085	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.67	0.67	0.67	0.76	0.76	0.76	0.73	0.73	0.73
Adj. Flow (vph)	116	0	8	199	0	27	14	1737	137	211	1227	100
RTOR Reduction (vph)	0	7	0	0	0	23	0	7	0	0	0	23
Lane Group Flow (vph)	116	1	0	99	100	4	14	1867	0	211	1227	77
Turn Type	Split			Split		Perm	Prot			Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.7	13.7		13.3	13.3	13.3	1.2	33.7		14.8	47.3	47.3
Effective Green, g (s)	13.7	13.7		13.3	13.3	13.3	1.2	33.7		14.8	47.3	47.3
Actuated g/C Ratio	0.15	0.15		0.14	0.14	0.14	0.01	0.37		0.16	0.51	0.51
Clearance Time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	5.5	5.5		5.5	5.5	5.5	2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	264	267		243	275	229	23	1843		285	2614	814
v/s Ratio Prot	c0.07	0.00		c0.06	0.05		0.01	c0.37		c0.12	0.24	
v/s Ratio Perm						0.00						0.05
v/c Ratio	0.44	0.00		0.41	0.36	0.02	0.61	1.01		0.74	0.47	0.09
Uniform Delay, d1	35.7	33.3		35.8	35.5	33.7	45.2	29.1		36.8	14.3	11.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.9	0.0		2.7	2.0	0.1	27.4	24.2		8.7	0.3	0.1
Delay (s)	38.5	33.4		38.5	37.5	33.8	72.6	53.4		45.5	14.6	11.5
Level of Service	D	C		D	D	C	E	D		D	B	B
Approach Delay (s)		38.2			37.5			53.5			18.6	
Approach LOS		D			D			D			B	























Intersection Summary

HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

29: Hayden Ct & Union Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	7	29	225	7	104	43	1209	10	35	1357	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1856		1681	1916	1583	1770	5079		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1856		1681	1916	1583	1770	5079		1770	5085	1583
Peak-hour factor, PHF	0.79	0.79	0.79	0.81	0.81	0.81	0.97	0.97	0.97	0.83	0.83	0.83
Adj. Flow (vph)	111	9	37	278	9	128	44	1246	10	42	1635	46
RTOR Reduction (vph)	0	32	0	0	0	102	0	1	0	0	0	10
Lane Group Flow (vph)	111	14	0	145	142	26	44	1255	0	42	1635	36
Turn Type	Split			Split		Perm	Prot			Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	10.3	10.3		16.2	16.2	16.2	4.0	32.1		4.0	32.1	32.1
Effective Green, g (s)	10.3	10.3		16.2	16.2	16.2	4.0	32.1		4.0	32.1	32.1
Actuated g/C Ratio	0.13	0.13		0.20	0.20	0.20	0.05	0.41		0.05	0.41	0.41
Clearance Time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	5.5	5.5		5.5	5.5	5.5	2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	230	242		344	392	324	90	2061		90	2064	642
v/s Ratio Prot	c0.06	0.01		c0.09	0.07		c0.02	0.25		0.02	c0.32	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.48	0.06		0.42	0.36	0.08	0.49	0.61		0.47	0.79	0.06
Uniform Delay, d1	31.9	30.1		27.4	27.0	25.4	36.6	18.5		36.5	20.6	14.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	0.2		2.0	1.4	0.3	1.5	0.8		1.4	2.5	0.1
Delay (s)	35.8	30.4		29.4	28.4	25.7	38.1	19.3		37.9	23.1	14.4
Level of Service	D	C		C	C	C	D	B		D	C	B
Approach Delay (s)		34.2			27.9			20.0			23.2	
Approach LOS		C			C			B			C	

Intersection Summary

















HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

**FRESNO HEAVY MAINTENANCE
EXISTING PLUS PROJECT CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: E Central Ave & Cedar Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	67	8	66	89	12	12	41	29	7	42	0
Peak Hour Factor	0.63	0.63	0.63	0.90	0.90	0.90	0.89	0.89	0.89	0.88	0.88	0.88
Hourly flow rate (vph)	0	106	13	73	99	13	13	46	33	8	48	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	119	186	92	56								
Volume Left (vph)	0	73	13	8								
Volume Right (vph)	13	13	33	0								
Hadj (s)	-0.03	0.07	-0.15	0.06								
Departure Headway (s)	4.4	4.5	4.5	4.8								
Degree Utilization, x	0.15	0.23	0.12	0.07								
Capacity (veh/h)	775	769	739	693								
Control Delay (s)	8.2	8.8	8.1	8.2								
Approach Delay (s)	8.2	8.8	8.1	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.4									
HCM Level of Service			A									
Intersection Capacity Utilization			28.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis







1: E Central Ave & Cedar Ave

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	109	7	35	78	8	9	33	39	9	18	4
Peak Hour Factor	0.80	0.80	0.80	0.83	0.83	0.83	0.84	0.84	0.84	0.70	0.70	0.70
Hourly flow rate (vph)	4	136	9	42	94	10	11	39	46	13	26	6
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	149	146	96	44								
Volume Left (vph)	4	42	11	13								
Volume Right (vph)	9	10	46	6								
Hadj (s)	0.00	0.05	-0.23	0.01								
Departure Headway (s)	4.4	4.5	4.4	4.7								
Degree Utilization, x	0.18	0.18	0.12	0.06								
Capacity (veh/h)	786	770	762	704								
Control Delay (s)	8.4	8.4	8.0	8.0								
Approach Delay (s)	8.4	8.4	8.0	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
HCM Level of Service			A									
Intersection Capacity Utilization			24.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: E Central Ave & SR 99 SB offramp







4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Volume (veh/h)	0	454	142	0	413	95
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.66	0.66	0.84	0.84
Hourly flow rate (vph)	0	554	215	0	492	113
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	215				769	215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	215				769	215
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	86
cM capacity (veh/h)	1355				369	825
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	554	215	605			
Volume Left	0	0	492			
Volume Right	0	0	113			
cSH	1700	1700	412			
Volume to Capacity	0.33	0.13	1.47			
Queue Length 95th (ft)	0	0	783			
Control Delay (s)	0.0	0.0	248.9			
Lane LOS			F			
Approach Delay (s)	0.0	0.0	248.9			
Approach LOS			F			
Intersection Summary						
Average Delay			109.6			
Intersection Capacity Utilization			59.2%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: E Central Ave & SR 99 SB offramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑↓	
Volume (veh/h)	0	385	152	0	244	91
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.75	0.75	0.99	0.99
Hourly flow rate (vph)	0	500	203	0	246	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	203				703	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	203				703	203
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				39	89
cM capacity (veh/h)	1369				404	838
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	500	203	338			
Volume Left	0	0	246			
Volume Right	0	0	92			
cSH	1700	1700	470			
Volume to Capacity	0.29	0.12	0.72			
Queue Length 95th (ft)	0	0	143			
Control Delay (s)	0.0	0.0	29.9			
Lane LOS			D			
Approach Delay (s)	0.0	0.0	29.9			
Approach LOS			D			
Intersection Summary						
Average Delay			9.7			
Intersection Capacity Utilization			46.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: E Central Ave & SR 99 NB onramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	75	730	174	285	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.81	0.81	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	93	901	196	320	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	196				1442	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	196				1442	356
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	100
cM capacity (veh/h)	1377				136	688
Direction, Lane #	EB 1	WB 1				
Volume Total	994	516				
Volume Left	93	0				
Volume Right	0	320				
cSH	1377	1700				
Volume to Capacity	0.07	0.30				
Queue Length 95th (ft)	5	0				
Control Delay (s)	1.7	0.0				
Lane LOS	A					
Approach Delay (s)	1.7	0.0				
Approach LOS						
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			75.9%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: E Central Ave & SR 99 NB onramp










4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	108	533	141	618	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	627	153	672	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	153				1370	489
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	153				1370	489
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				100	100
cM capacity (veh/h)	1427				147	579
Direction, Lane #	EB 1	WB 1				
Volume Total	754	825				
Volume Left	127	0				
Volume Right	0	672				
cSH	1427	1700				
Volume to Capacity	0.09	0.49				
Queue Length 95th (ft)	7	0				
Control Delay (s)	2.2	0.0				
Lane LOS	A					
Approach Delay (s)	2.2	0.0				
Approach LOS						
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			86.2%		ICU Level of Service	E
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: S.Chestnut Ave & SR 99 NB off ramp

4/25/2011

						
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	330	0	0	755	156	485
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.82	0.82	0.91	0.91
Hourly flow rate (vph)	375	0	0	921	171	533
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			375		1296	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			375		1296	375
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		4	21
cM capacity (veh/h)			1183		179	671
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	375	921	704			
Volume Left	0	0	171			
Volume Right	0	0	533			
cSH	1700	1700	402			
Volume to Capacity	0.22	0.54	1.75			
Queue Length 95th (ft)	0	0	1095			
Control Delay (s)	0.0	0.0	371.9			
Lane LOS			F			
Approach Delay (s)	0.0	0.0	371.9			
Approach LOS			F			
Intersection Summary						
Average Delay			131.0			
Intersection Capacity Utilization			84.9%	ICU Level of Service		E
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: S. Chestnut Ave & SR 99 NB off ramp









4/25/2011

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	317	0	0	532	32	299
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.84	0.84
Hourly flow rate (vph)	352	0	0	578	38	356
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			352		930	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			352		930	352
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	49
cM capacity (veh/h)			1207		296	691
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	352	578	394			
Volume Left	0	0	38			
Volume Right	0	0	356			
cSH	1700	1700	612			
Volume to Capacity	0.21	0.34	0.64			
Queue Length 95th (ft)	0	0	116			
Control Delay (s)	0.0	0.0	20.9			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	20.9			
Approach LOS			C			
Intersection Summary						
Average Delay			6.2			
Intersection Capacity Utilization			54.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis









5: SR 99 SB on ramp &

4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	165	27	158	303
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	190	31	182	348
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	917	205			221	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	917	205			221	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			87	
cM capacity (veh/h)	261	835			1348	
Direction, Lane #	NB 1	SB 1				
Volume Total	221	530				
Volume Left	0	182				
Volume Right	31	0				
cSH	1700	1348				
Volume to Capacity	0.13	0.13				
Queue Length 95th (ft)	0	12				
Control Delay (s)	0.0	3.7				
Lane LOS		A				
Approach Delay (s)	0.0	3.7				
Approach LOS						
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			41.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 5: SR 99 SB on ramp &











4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	319	65	265	299
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.87	0.87	0.92	0.92
Hourly flow rate (vph)	0	0	367	75	288	325
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1305	404			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1305	404			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			74	
cM capacity (veh/h)	131	647			1119	
Direction, Lane #	NB 1	SB 1				
Volume Total	441	613				
Volume Left	0	288				
Volume Right	75	0				
cSH	1700	1119				
Volume to Capacity	0.26	0.26				
Queue Length 95th (ft)	0	26				
Control Delay (s)	0.0	6.0				
Lane LOS		A				
Approach Delay (s)	0.0	6.0				
Approach LOS						
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			57.8%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: E American Avenue & SR 99 SB off ramp







4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	132	124	0	81	198
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.64	0.64	0.75	0.75
Hourly flow rate (vph)	0	155	194	0	108	264
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	194				349	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	194				349	194
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				83	69
cM capacity (veh/h)	1379				648	848
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	155	194	108	264		
Volume Left	0	0	108	0		
Volume Right	0	0	0	264		
cSH	1700	1700	648	848		
Volume to Capacity	0.09	0.11	0.17	0.31		
Queue Length 95th (ft)	0	0	15	33		
Control Delay (s)	0.0	0.0	11.7	11.2		
Lane LOS			B	B		
Approach Delay (s)	0.0	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			25.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: E American Avenue & SR 99 SB off ramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Volume (veh/h)	0	297	64	0	56	72
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.85	0.85
Hourly flow rate (vph)	0	386	83	0	66	85
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	83				469	83
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83				469	83
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	91
cM capacity (veh/h)	1514				553	976
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	386	83	66	85		
Volume Left	0	0	66	0		
Volume Right	0	0	0	85		
cSH	1700	1700	553	976		
Volume to Capacity	0.23	0.05	0.12	0.09		
Queue Length 95th (ft)	0	0	10	7		
Control Delay (s)	0.0	0.0	12.4	9.0		
Lane LOS			B	A		
Approach Delay (s)	0.0	0.0	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			25.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: E American Ave & SR 99 NB on ramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	79	136	114	68	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.73	0.73	0.92	0.92
Hourly flow rate (vph)	93	160	156	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	156				549	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156				549	203
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	100
cM capacity (veh/h)	1424				465	838
Direction, Lane #	EB 1	WB 1				
Volume Total	253	249				
Volume Left	93	0				
Volume Right	0	93				
cSH	1424	1700				
Volume to Capacity	0.07	0.15				
Queue Length 95th (ft)	5	0				
Control Delay (s)	3.2	0.0				
Lane LOS	A					
Approach Delay (s)	3.2	0.0				
Approach LOS						
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			28.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: E American Ave & SR 99 NB on ramp

















4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	185	183	67	88	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.76	0.76	0.92	0.92
Hourly flow rate (vph)	176	195	88	116	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	88				692	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	88				692	146
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				100	100
cM capacity (veh/h)	1508				362	901
Direction, Lane #	EB 1	WB 1				
Volume Total	370	204				
Volume Left	176	0				
Volume Right	0	116				
cSH	1508	1700				
Volume to Capacity	0.12	0.12				
Queue Length 95th (ft)	10	0				
Control Delay (s)	4.2	0.0				
Lane LOS	A					
Approach Delay (s)	4.2	0.0				
Approach LOS						
Intersection Summary						
Average Delay		2.7				
Intersection Capacity Utilization		34.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8: Adams Ave & Chestnut Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	16	50	4	5	48	15	5	63	4	8	54	23
Peak Hour Factor	0.58	0.58	0.58	0.68	0.68	0.68	0.71	0.71	0.71	0.75	0.75	0.75
Hourly flow rate (vph)	28	86	7	7	71	22	7	89	6	11	72	31
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	121	100	101	113								
Volume Left (vph)	28	7	7	11								
Volume Right (vph)	7	22	6	31								
Hadj (s)	0.05	-0.08	0.01	-0.11								
Departure Headway (s)	4.6	4.5	4.6	4.4								
Degree Utilization, x	0.15	0.12	0.13	0.14								
Capacity (veh/h)	739	754	742	760								
Control Delay (s)	8.4	8.1	8.2	8.2								
Approach Delay (s)	8.4	8.1	8.2	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.2								
HCM Level of Service				A								
Intersection Capacity Utilization				21.2%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

8: Adams Ave & Chestnut Ave










4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	29	57	4	4	42	7	2	68	8	8	57	28
Peak Hour Factor	0.83	0.83	0.83	0.70	0.70	0.70	0.71	0.71	0.71	0.66	0.66	0.66
Hourly flow rate (vph)	35	69	5	6	60	10	3	96	11	12	86	42
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	108	76	110	141								
Volume Left (vph)	35	6	3	12								
Volume Right (vph)	5	10	11	42								
Hadj (s)	0.07	-0.03	-0.02	-0.13								
Departure Headway (s)	4.6	4.6	4.5	4.3								
Degree Utilization, x	0.14	0.10	0.14	0.17								
Capacity (veh/h)	724	730	761	782								
Control Delay (s)	8.4	8.1	8.2	8.2								
Approach Delay (s)	8.4	8.1	8.2	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.2									
HCM Level of Service			A									
Intersection Capacity Utilization			26.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: Clayton Ave & SR 99 SB off ramp










4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	84	87	0	23	6
Sign Control	Free			Stop	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.89	0.89	0.81	0.81
Hourly flow rate (vph)	0	117	98	0	28	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		14	0	0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		14	0	0	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		90	100	97	99
cM capacity (veh/h)	1623		971	896	896	1085
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	117	98	36			
Volume Left	0	98	0			
Volume Right	117	0	7			
cSH	1700	971	929			
Volume to Capacity	0.07	0.10	0.04			
Queue Length 95th (ft)	0	8	3			
Control Delay (s)	0.0	9.1	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	9.1	9.0			
Approach LOS		A	A			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			15.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Clayton Ave & SR 99 SB off ramp
















4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	136	95	0	96	10
Sign Control	Free			Stop	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.90	0.90	0.91	0.91
Hourly flow rate (vph)	0	170	106	0	105	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		53	0	0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		53	0	0	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		88	100	88	99
cM capacity (veh/h)	1623		852	896	896	1085
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	170	106	116			
Volume Left	0	106	0			
Volume Right	170	0	11			
cSH	1700	852	911			
Volume to Capacity	0.10	0.12	0.13			
Queue Length 95th (ft)	0	11	11			
Control Delay (s)	0.0	9.8	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	9.8	9.5			
Approach LOS		A	A			
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			20.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: SR 99 NB off ramp &
















4/25/2011

										
Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations										
Volume (veh/h)	0	0	79	75	0	0	497	18	79	346
Sign Control	Stop			Free			Free		Stop	
Grade	0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.80	0.80	0.80	0.79	0.79	0.79	0.76	0.76
Hourly flow rate (vph)	0	0	99	94	0	0	629	23	104	455
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type				None			None			
Median storage (veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	937	932	652			94			943	47
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	937	932	652			94			943	47
tC, single (s)	7.5	6.5	4.1			4.1			6.5	6.9
tC, 2 stage (s)										
tF (s)	3.5	4.0	2.2			2.2			4.0	3.3
p0 queue free %	100	100	89			100			55	55
cM capacity (veh/h)	73	237	931			1498			233	1012
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	NW 1	NW 2			
Volume Total	99	47	47	419	232	104	455			
Volume Left	99	0	0	0	0	0	0			
Volume Right	0	0	0	0	23	0	455			
cSH	931	1700	1700	1700	1700	233	1012			
Volume to Capacity	0.11	0.03	0.03	0.25	0.14	0.45	0.45			
Queue Length 95th (ft)	9	0	0	0	0	53	59			
Control Delay (s)	9.3	0.0	0.0	0.0	0.0	32.3	11.4			
Lane LOS	A					D	B			
Approach Delay (s)	4.8			0.0		15.3				
Approach LOS						C				
Intersection Summary										
Average Delay			6.8							
Intersection Capacity Utilization			33.1%		ICU Level of Service				A	
Analysis Period (min)			15							

HCM Unsignalized Intersection Capacity Analysis

10: SR 99 NB off ramp &


















4/25/2011

										
Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations										
Volume (veh/h)	0	0	44	111	0	0	476	12	81	400
Sign Control	Stop			Free			Free		Stop	
Grade	0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.88	0.83	0.83	0.83	0.81	0.81
Hourly flow rate (vph)	0	0	50	126	0	0	573	14	100	494
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type				None			None			
Median storage (veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	794	807	588			126			814	63
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	794	807	588			126			814	63
tC, single (s)	7.5	6.5	4.1			4.1			6.5	6.9
tC, 2 stage (s)										
tF (s)	3.5	4.0	2.2			2.2			4.0	3.3
p0 queue free %	100	100	95			100			66	50
cM capacity (veh/h)	99	298	983			1458			295	988
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	NW 1	NW 2			
Volume Total	50	63	63	382	206	100	494			
Volume Left	50	0	0	0	0	0	0			
Volume Right	0	0	0	0	14	0	494			
cSH	983	1700	1700	1700	1700	295	988			
Volume to Capacity	0.05	0.04	0.04	0.22	0.12	0.34	0.50			
Queue Length 95th (ft)	4	0	0	0	0	36	72			
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	23.3	12.2			
Lane LOS	A					C	B			
Approach Delay (s)	2.5			0.0		14.1				
Approach LOS						B				
Intersection Summary										
Average Delay			6.5							
Intersection Capacity Utilization			34.8%		ICU Level of Service				A	
Analysis Period (min)			15							

HCM Unsignalized Intersection Capacity Analysis

11: SR 99 SB onramp & S Clovis Ave


















4/25/2011

											
Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations											
Volume (veh/h)	0	0	3	136	14	422	79	81	19	61	24
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.80	0.80	0.80	0.80	0.80	0.80	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	4	170	18	528	99	101	22	69	27
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											4
Median type				None			None				
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1325	1441	200			170			1297	1382	100
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1325	1441	200			170			1297	1382	100
tC, single (s)	7.5	6.5	4.1			4.1			7.5	6.5	6.9
tC, 2 stage (s)											
tF (s)	3.5	4.0	2.2			2.2			3.5	4.0	3.3
p0 queue free %	100	100	100			62			74	22	97
cM capacity (veh/h)	30	82	1370			1405			84	89	936
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SE 1				
Volume Total	4	113	74	528	66	134	118				
Volume Left	4	0	0	528	0	0	22				
Volume Right	0	0	18	0	0	101	27				
cSH	1370	1700	1700	1405	1700	1700	113				
Volume to Capacity	0.00	0.07	0.04	0.38	0.04	0.08	1.04				
Queue Length 95th (ft)	0	0	0	44	0	0	175				
Control Delay (s)	7.6	0.0	0.0	9.1	0.0	0.0	169.7				
Lane LOS	A			A			F				
Approach Delay (s)	0.1			6.6			169.7				
Approach LOS							F				
Intersection Summary											
Average Delay			24.0								
Intersection Capacity Utilization			42.0%		ICU Level of Service				A		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

11: SR 99 SB onramp & S Clovis Ave

4/25/2011



















											
Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations											
Volume (veh/h)	0	0	12	111	6	393	85	82	41	93	95
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.87	0.87	0.87	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	14	128	7	462	100	96	48	109	112
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											4
Median type				None			None				
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1188	1280	196			128			1164	1228	98
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1188	1280	196			128			1164	1228	98
tC, single (s)	7.5	6.5	4.1			4.1			7.5	6.5	6.9
tC, 2 stage (s)											
tF (s)	3.5	4.0	2.2			2.2			3.5	4.0	3.3
p0 queue free %	100	100	99			68			57	8	88
cM capacity (veh/h)	20	111	1374			1456			112	119	939
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SE 1				
Volume Total	14	85	49	462	67	130	269				
Volume Left	14	0	0	462	0	0	48				
Volume Right	0	0	7	0	0	96	112				
cSH	1374	1700	1700	1456	1700	1700	189				
Volume to Capacity	0.01	0.05	0.03	0.32	0.04	0.08	1.43				
Queue Length 95th (ft)	1	0	0	35	0	0	407				
Control Delay (s)	7.6	0.0	0.0	8.6	0.0	0.0	266.7				
Lane LOS	A			A			F				
Approach Delay (s)	0.7			6.0			266.7				
Approach LOS							F				
Intersection Summary											
Average Delay			70.5								
Intersection Capacity Utilization			42.5%		ICU Level of Service				A		
Analysis Period (min)			15								

**HANFORD HEAVY MAINTENANCE
EXISTING PLUS PROJECT CONDITIONS**

HCM Signalized Intersection Capacity Analysis

1: Houston Ave & Central Valley Hwy



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	50	24	11	60	77	20	193	5	79	241	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.93		1.00	1.00		1.00	0.99	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779			1725		1770	1856		1770	1838	
Flt Permitted		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1779			1725		1770	1856		1770	1838	
Peak-hour factor, PHF	0.95	0.95	0.95	0.90	0.90	0.90	0.96	0.96	0.96	0.93	0.93	0.93
Adj. Flow (vph)	47	53	25	12	67	86	21	201	5	85	259	25
RTOR Reduction (vph)	0	13	0	0	56	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	112	0	0	109	0	21	204	0	85	279	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		16.0			16.0		4.0	16.0		6.0	18.0	
Effective Green, g (s)		16.0			16.0		4.0	16.0		6.0	18.0	
Actuated g/C Ratio		0.23			0.23		0.06	0.23		0.09	0.26	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		407			394		101	424		152	473	
v/s Ratio Prot		c0.06			c0.06		0.01	0.11		c0.05	c0.15	
v/s Ratio Perm												
v/c Ratio		0.27			0.28		0.21	0.48		0.56	0.59	
Uniform Delay, d1		22.2			22.2		31.5	23.4		30.7	22.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7			1.7		4.6	3.9		14.0	5.3	
Delay (s)		23.9			24.0		36.1	27.3		44.8	28.1	
Level of Service		C			C		D	C		D	C	
Approach Delay (s)		23.9			24.0			28.1			31.9	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			28.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			45.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Houston Ave & Central Valley Hwy

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	50	24	6	78	106	31	365	14	94	179	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.92		1.00	0.99		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779			1720		1770	1853		1770	1828	
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1779			1720		1770	1853		1770	1828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.85	0.85	0.85	0.89	0.89	0.89
Adj. Flow (vph)	25	54	26	7	93	126	36	429	16	106	201	29
RTOR Reduction (vph)	0	17	0	0	65	0	0	2	0	0	7	0
Lane Group Flow (vph)	0	88	0	0	161	0	36	443	0	106	223	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		16.0			16.0		4.0	16.0		6.0	18.0	
Effective Green, g (s)		16.0			16.0		4.0	16.0		6.0	18.0	
Actuated g/C Ratio		0.23			0.23		0.06	0.23		0.09	0.26	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		407			393		101	424		152	470	
v/s Ratio Prot		c0.05			c0.09		0.02	c0.24		c0.06	0.12	
v/s Ratio Perm												
v/c Ratio		0.22			0.41		0.36	1.05		0.70	0.47	
Uniform Delay, d1		21.9			23.0		31.8	27.0		31.1	22.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			3.1		9.6	56.2		23.3	3.4	
Delay (s)		23.1			26.1		41.3	83.2		54.4	25.4	
Level of Service		C			C		D	F		D	C	
Approach Delay (s)		23.1			26.1			80.1			34.5	
Approach LOS		C			C			F			C	
Intersection Summary												
HCM Average Control Delay			50.9				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			70.0							16.0		
Intersection Capacity Utilization			51.1%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Houston Ave & 7Th Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	116	0	3	143	1	1	1	1	2	1	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.91	0.91	0.91	0.38	0.38	0.38	0.75	0.75	0.75
Hourly flow rate (vph)	2	135	0	3	157	1	3	3	3	3	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	96	17	1	83	16	4	1			5		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96	17	1	83	16	4	1			5		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	85	100	100	82	100	100			100		
cM capacity (veh/h)	762	874	1083	795	875	1080	1621			1616		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	137	162	8	4								
Volume Left	2	3	3	3								
Volume Right	0	1	3	0								
cSH	872	875	1621	1616								
Volume to Capacity	0.16	0.18	0.00	0.00								
Queue Length 95th (ft)	14	17	0	0								
Control Delay (s)	9.9	10.0	2.4	4.8								
Lane LOS	A	B	A	A								
Approach Delay (s)	9.9	10.0	2.4	4.8								
Approach LOS	A	B										
Intersection Summary												
Average Delay			9.7									
Intersection Capacity Utilization			19.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Houston Ave & 7Th Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	158	1	2	172	1	2	1	1	2	0	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.85	0.85	0.85	0.50	0.50	0.50	0.75	0.75	0.75
Hourly flow rate (vph)	1	180	1	2	202	1	4	2	2	3	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	119	18	1	108	18	3	1			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119	18	1	108	18	3	1			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	79	100	100	77	100	100			100		
cM capacity (veh/h)	700	872	1084	730	873	1081	1621			1618		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	182	206	8	4								
Volume Left	1	2	4	3								
Volume Right	1	1	2	1								
cSH	872	872	1621	1618								
Volume to Capacity	0.21	0.24	0.00	0.00								
Queue Length 95th (ft)	20	23	0	0								
Control Delay (s)	10.2	10.4	3.6	4.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.2	10.4	3.6	4.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay			10.1									
Intersection Capacity Utilization			20.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Idaho Ave & Central Valley Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	11	5	11	15	11	6	211	16	9	229	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.61	0.61	0.61	0.80	0.80	0.80	0.90	0.90	0.90
Hourly flow rate (vph)	3	12	6	18	25	18	8	264	20	10	254	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	598	578	259	579	572	274	263			284		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	598	578	259	579	572	274	263			284		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	96	94	98	99			99		
cM capacity (veh/h)	382	421	780	409	424	765	1301			1279		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	21	61	291	273								
Volume Left	3	18	8	10								
Volume Right	6	18	20	9								
cSH	471	483	1301	1279								
Volume to Capacity	0.04	0.13	0.01	0.01								
Queue Length 95th (ft)	4	11	0	1								
Control Delay (s)	13.0	13.5	0.3	0.4								
Lane LOS	B	B	A	A								
Approach Delay (s)	13.0	13.5	0.3	0.4								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			27.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Idaho Ave & Central Valley Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	13	3	18	9	14	7	347	10	6	202	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.72	0.72	0.72	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	16	4	25	12	19	8	413	12	7	240	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	718	698	242	704	694	419	244			425		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	718	698	242	704	694	419	244			425		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	96	100	93	97	97	99			99		
cM capacity (veh/h)	322	360	797	335	362	634	1322			1134		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	25	57	433	251								
Volume Left	6	25	8	7								
Volume Right	4	19	12	4								
cSH	379	407	1322	1134								
Volume to Capacity	0.07	0.14	0.01	0.01								
Queue Length 95th (ft)	5	12	0	0								
Control Delay (s)	15.2	15.3	0.2	0.3								
Lane LOS	C	C	A	A								
Approach Delay (s)	15.2	15.3	0.2	0.3								
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			32.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Idaho Ave & 7Th Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	21	1	0	28	1	0	1	0	0	2	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.68	0.68	0.68	0.25	0.25	0.25	0.75	0.75	0.75
Hourly flow rate (vph)	0	28	1	0	41	1	0	4	0	0	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43			29			73	71	29	73	71	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43			29			73	71	29	73	71	42
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1566			1584			914	819	1046	915	819	1029
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	29	43	4	4								
Volume Left	0	0	0	0								
Volume Right	1	1	0	1								
cSH	1566	1584	819	879								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.0	0.0	9.4	9.1								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	9.4	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			13.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Idaho Ave & 7Th Ave

4/25/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	20	1	1	24	1	2	1	0	1	2	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.69	0.69	0.69	0.75	0.75	0.75	0.50	0.50	0.50
Hourly flow rate (vph)	0	25	1	1	35	1	3	1	0	2	4	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	36			27			68	65	26	65	65	36
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	36			27			68	65	26	65	65	36
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1575			1587			918	825	1050	927	825	1037
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	27	38	4	8								
Volume Left	0	1	3	2								
Volume Right	1	1	0	2								
cSH	1575	1587	885	895								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (ft)	0	0	0	1								
Control Delay (s)	0.0	0.3	9.1	9.1								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.3	9.1	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			13.3%		ICU Level of Service				A			
Analysis Period (min)			15									

**WASCO HEAVY MAINTENANCE
EXISTING PLUS PROJECT CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: Paso Robles Hwy & Wasco Pond Rd



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	61	184	57	18	208	17	43	82	24	18	82	26
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.92	0.92	0.92	0.93	0.93	0.93	0.83	0.83	0.83
Hourly flow rate (vph)	90	271	84	20	226	18	46	88	26	22	99	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	245			354			838	776	312	794	808	235
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			354			838	776	312	794	808	235
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			98			76	71	96	90	66	96
cM capacity (veh/h)	1322			1204			190	301	728	214	289	804
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	90	354	20	245	160	152						
Volume Left	90	0	20	0	46	22						
Volume Right	0	84	0	18	26	31						
cSH	1322	1700	1204	1700	280	315						
Volume to Capacity	0.07	0.21	0.02	0.14	0.57	0.48						
Queue Length 95th (ft)	5	0	1	0	82	62						
Control Delay (s)	7.9	0.0	8.0	0.0	33.7	26.7						
Lane LOS	A		A		D	D						
Approach Delay (s)	1.6		0.6		33.7	26.7						
Approach LOS					D	D						
Intersection Summary												
Average Delay			10.1									
Intersection Capacity Utilization			41.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Paso Robles Hwy & Wasco Pond Rd


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	57	215	45	41	231	18	44	86	22	20	132	77
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.80	0.80	0.80	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	65	244	51	51	289	22	49	97	25	22	145	85
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	311			295			948	813	270	849	828	300
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311			295			948	813	270	849	828	300
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			96			58	66	97	88	48	89
cM capacity (veh/h)	1249			1266			118	284	769	187	279	740
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	65	295	51	311	171	252						
Volume Left	65	0	51	0	49	22						
Volume Right	0	51	0	22	25	85						
cSH	1249	1700	1266	1700	216	335						
Volume to Capacity	0.05	0.17	0.04	0.18	0.79	0.75						
Queue Length 95th (ft)	4	0	3	0	142	146						
Control Delay (s)	8.0	0.0	8.0	0.0	64.9	42.1						
Lane LOS	A		A		F	E						
Approach Delay (s)	1.4		1.1		64.9	42.1						
Approach LOS					F	E						
Intersection Summary												
Average Delay			19.7									
Intersection Capacity Utilization			46.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: 6th Street & Wasco Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	5	0	1	0	7	105	2	0	87	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.56	0.56	0.56	0.25	0.25	0.25	0.89	0.89	0.89	0.96	0.96	0.96
Hourly flow rate (vph)	27	0	9	0	4	0	8	118	2	0	91	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232	232	96	240	237	119	102			120		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232	232	96	240	237	119	102			120		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	99	100	99	100	99			100		
cM capacity (veh/h)	717	664	960	705	660	933	1490			1467		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	36	4	8	120	102							
Volume Left	27	0	8	0	0							
Volume Right	9	0	0	2	11							
cSH	765	660	1490	1700	1467							
Volume to Capacity	0.05	0.01	0.01	0.07	0.00							
Queue Length 95th (ft)	4	0	0	0	0							
Control Delay (s)	9.9	10.5	7.4	0.0	0.0							
Lane LOS	A	B	A									
Approach Delay (s)	9.9	10.5	0.5		0.0							
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			20.3%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: 6th Street & Wasco Ave

4/25/2011

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	0	6	0	0	0	9	75	0	0	161	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.92	0.92	0.92	0.93	0.93	0.93	0.83	0.83	0.83
Hourly flow rate (vph)	21	0	7	0	0	0	10	81	0	0	194	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	310	310	210	317	325	81	225			81		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310	310	210	317	325	81	225			81		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	100	100	100	99			100		
cM capacity (veh/h)	639	600	831	627	588	979	1343			1517		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	28	0	10	81	225							
Volume Left	21	0	10	0	0							
Volume Right	7	0	0	0	31							
cSH	680	1700	1343	1700	1517							
Volume to Capacity	0.04	0.00	0.01	0.05	0.00							
Queue Length 95th (ft)	3	0	1	0	0							
Control Delay (s)	10.5	0.0	7.7	0.0	0.0							
Lane LOS	B	A	A									
Approach Delay (s)	10.5	0.0	0.8		0.0							
Approach LOS	B	A										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			20.1%			ICU Level of Service				A		
Analysis Period (min)			15									

**SHAFTER HEAVY MAINTENANCE
EXISTING PLUS PROJECT CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: Burbank Street & Santa Fe Way

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	1	19	16	1	11	8	12	277	2	15	467	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.56	0.56	0.56	0.50	0.50	0.50	0.71	0.71	0.71	0.79	0.79	0.79
Hourly flow rate (vph)	2	34	29	2	22	16	17	390	3	19	591	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1081	1054	392	1100	1056	591	591			393		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1081	1054	392	1100	1056	591	591			393		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	84	96	99	90	97	98			98		
cM capacity (veh/h)	170	218	657	156	218	507	985			1166		
Direction, Lane #	EB 1	WB 1	SE 1	NW 1								
Volume Total	64	40	410	610								
Volume Left	2	2	17	19								
Volume Right	29	16	3	0								
cSH	307	275	985	1166								
Volume to Capacity	0.21	0.15	0.02	0.02								
Queue Length 95th (ft)	19	13	1	1								
Control Delay (s)	19.8	20.3	0.5	0.5								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.8	20.3	0.5	0.5								
Approach LOS	C	C										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			40.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Burbank Street & Santa Fe Way













4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	1	14	12	0	19	35	19	501	1	21	350	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.56	0.56	0.56	0.52	0.52	0.52	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	2	25	21	0	37	67	21	551	1	23	380	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1106	1022	551	1055	1021	382	384			552		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1106	1022	551	1055	1021	382	384			552		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	89	96	100	84	90	98			98		
cM capacity (veh/h)	144	227	534	174	227	665	1175			1018		
Direction, Lane #	EB 1	WB 1	SE 1	NW 1								
Volume Total	48	104	573	407								
Volume Left	2	0	21	23								
Volume Right	21	67	1	3								
cSH	296	396	1175	1018								
Volume to Capacity	0.16	0.26	0.02	0.02								
Queue Length 95th (ft)	14	26	1	2								
Control Delay (s)	19.5	17.3	0.5	0.7								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.5	17.3	0.5	0.7								
Approach LOS	C	C										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			42.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

2: Galpin & Santa Fe Way













4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	73	5	229	61	15	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.91	0.91
Adj. Flow (vph)	90	6	283	75	16	497
RTOR Reduction (vph)	0	5	0	31	0	0
Lane Group Flow (vph)	90	1	283	44	16	497
Turn Type		Prot		Perm	Prot	
Protected Phases	3	3	6		5	2
Permitted Phases				6		
Actuated Green, G (s)	3.2	3.2	22.0	22.0	0.7	26.7
Effective Green, g (s)	3.2	3.2	22.0	22.0	0.7	26.7
Actuated g/C Ratio	0.08	0.08	0.58	0.58	0.02	0.70
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	149	134	1081	919	33	1312
v/s Ratio Prot	c0.05	0.00	0.15		0.01	c0.27
v/s Ratio Perm				0.03		
v/c Ratio	0.60	0.00	0.26	0.05	0.48	0.38
Uniform Delay, d1	16.7	15.9	3.9	3.4	18.4	2.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	0.0	0.1	0.0	10.8	0.2
Delay (s)	23.5	15.9	4.1	3.5	29.2	2.4
Level of Service	C	B	A	A	C	A
Approach Delay (s)	23.0		3.9			3.3
Approach LOS	C		A			A
Intersection Summary						
HCM Average Control Delay			5.5		HCM Level of Service	A
HCM Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			37.9		Sum of lost time (s)	8.0
Intersection Capacity Utilization			34.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

2: Galpin & Santa Fe Way

4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	55	21	504	58	9	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.92	0.92
Adj. Flow (vph)	61	23	573	66	10	303
RTOR Reduction (vph)	0	21	0	26	0	0
Lane Group Flow (vph)	61	2	573	40	10	303
Turn Type		Prot		Perm	Prot	
Protected Phases	3	3	6		5	2
Permitted Phases				6		
Actuated Green, G (s)	3.1	3.1	24.5	24.5	0.7	29.2
Effective Green, g (s)	3.1	3.1	24.5	24.5	0.7	29.2
Actuated g/C Ratio	0.08	0.08	0.61	0.61	0.02	0.72
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	136	122	1133	962	31	1350
v/s Ratio Prot	c0.03	0.00	c0.31		0.01	c0.16
v/s Ratio Perm				0.03		
v/c Ratio	0.45	0.01	0.51	0.04	0.32	0.22
Uniform Delay, d1	17.8	17.2	4.5	3.2	19.6	1.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.0	0.4	0.0	6.0	0.1
Delay (s)	20.1	17.2	4.8	3.2	25.5	1.9
Level of Service	C	B	A	A	C	A
Approach Delay (s)	19.3		4.7			2.7
Approach LOS	B		A			A

Intersection Summary


















HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	40.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

**CORCORAN EXISTING PLUS PROJECT
CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: Brokaw Ave & Chittenden Ave


















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	6	0	0	0	5	0	0	0	87	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.61	0.61	0.61	0.71	0.71	0.71	0.70	0.70	0.70	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	10	0	0	0	7	0	0	0	98	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											284	
pX, platoon unblocked												
vC, conflicting volume	133	133	70	73	154	0	139			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133	133	70	73	154	0	139			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	823	753	979	897	734	1084	1442			1622		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	10	0	7	0	65	74						
Volume Left	0	0	7	0	0	0						
Volume Right	10	0	0	0	0	42						
cSH	979	1700	1442	1700	1700	1700						
Volume to Capacity	0.01	0.00	0.00	0.00	0.04	0.04						
Queue Length 95th (ft)	1	0	0	0	0	0						
Control Delay (s)	8.7	0.0	7.5	0.0	0.0	0.0						
Lane LOS	A	A	A									
Approach Delay (s)	8.7	0.0	7.5		0.0							
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			14.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Brokaw Ave & Chittenden Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	6	0	0	0	16	0	0	0	95	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.75	0.75	0.75	0.75	0.75	0.75	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	9	0	0	0	21	0	0	0	119	44
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											284	
pX, platoon unblocked												
vC, conflicting volume	183	183	81	111	205	0	162			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183	183	81	111	205	0	162			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	98			100		
cM capacity (veh/h)	752	699	962	839	680	1084	1414			1622		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	9	0	21	0	79	83						
Volume Left	0	0	21	0	0	0						
Volume Right	9	0	0	0	0	44						
cSH	962	1700	1414	1700	1700	1700						
Volume to Capacity	0.01	0.00	0.02	0.00	0.05	0.05						
Queue Length 95th (ft)	1	0	1	0	0	0						
Control Delay (s)	8.8	0.0	7.6	0.0	0.0	0.0						
Lane LOS	A	A	A									
Approach Delay (s)	8.8	0.0	7.6		0.0							
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			20.4%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

















2: Whitley Ave & Chittenden Ave

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	189	10	5	88	12	6	14	31	9	21	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.76	0.76	0.76	0.54	0.54	0.54	0.83	0.83	0.83
Hourly flow rate (vph)	25	236	12	7	116	16	11	26	57	11	25	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	132			249			478	437	242	500	436	124
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132			249			478	437	242	500	436	124
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	95	93	97	95	96
cM capacity (veh/h)	1454			1317			452	502	796	422	503	927
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	274	138	94	72								
Volume Left	25	7	11	11								
Volume Right	12	16	57	36								
cSH	1454	1317	637	628								
Volume to Capacity	0.02	0.00	0.15	0.12								
Queue Length 95th (ft)	1	0	13	10								
Control Delay (s)	0.8	0.4	11.6	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	0.4	11.6	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			29.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: Whitley Ave & Chittenden Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	207	20	12	165	18	11	21	49	5	30	47
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.89	0.89	0.89	0.91	0.91	0.91	0.73	0.73	0.73
Hourly flow rate (vph)	55	280	27	13	185	20	12	23	54	7	41	64
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	206			307			711	637	293	692	640	196
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	206			307			711	637	293	692	640	196
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			96	94	93	98	89	92
cM capacity (veh/h)	1366			1254			283	375	746	305	373	846
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	362	219	89	112								
Volume Left	55	13	12	7								
Volume Right	27	20	54	64								
cSH	1366	1254	504	538								
Volume to Capacity	0.04	0.01	0.18	0.21								
Queue Length 95th (ft)	3	1	16	19								
Control Delay (s)	1.5	0.6	13.7	13.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.5	0.6	13.7	13.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			40.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Whitley Ave & Pickerell Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	114	9	14	67	6	4	11	13	3	15	47
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.76	0.76	0.76	0.78	0.78	0.78	0.70	0.70	0.70
Hourly flow rate (vph)	88	156	12	18	88	8	5	14	17	4	21	67
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	96			168			496	471	84	406	473	48
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			168			496	471	84	406	473	48
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			99	97	98	99	95	93
cM capacity (veh/h)	1495			1407			389	455	958	480	454	1011
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	166	90	62	52	36	93						
Volume Left	88	0	18	0	5	4						
Volume Right	0	12	0	8	17	67						
cSH	1495	1700	1407	1700	583	757						
Volume to Capacity	0.06	0.05	0.01	0.03	0.06	0.12						
Queue Length 95th (ft)	5	0	1	0	5	10						
Control Delay (s)	4.2	0.0	2.3	0.0	11.6	10.4						
Lane LOS	A		A		B	B						
Approach Delay (s)	2.7		1.3		11.6	10.4						
Approach LOS					B	B						
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			22.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Whitley Ave & Pickerell Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	84	114	6	15	112	13	9	14	17	4	12	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.81	0.81	0.81	0.91	0.91	0.91	0.81	0.81	0.81
Hourly flow rate (vph)	124	168	9	19	138	16	10	15	19	5	15	62
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	154			176			594	610	88	541	607	77
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154			176			594	610	88	541	607	77
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			99			97	96	98	99	96	94
cM capacity (veh/h)	1424			1397			326	367	952	372	369	968
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	207	93	88	85	44	81						
Volume Left	124	0	19	0	10	5						
Volume Right	0	9	0	16	19	62						
cSH	1424	1700	1397	1700	479	695						
Volume to Capacity	0.09	0.05	0.01	0.05	0.09	0.12						
Queue Length 95th (ft)	7	0	1	0	8	10						
Control Delay (s)	4.9	0.0	1.7	0.0	13.3	10.9						
Lane LOS	A		A		B	B						
Approach Delay (s)	3.4		0.9		13.3	10.9						
Approach LOS					B	B						
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			24.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Sherman Ave & Santa Fe Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	11	0	0	0	5	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.69	0.69	0.69	0.83	0.83	0.83	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	0	0	0	16	0	0	0	6	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	29	13	0	13	13	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	29	13	0	13	13	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
pO queue free %	100	100	100	100	100	99	100			100		
cM capacity (veh/h)	963	878	1085	1001	878	1085	1623			1623		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	16	0	6								
Volume Left	0	0	0	6								
Volume Right	0	16	0	0								
cSH	1700	1085	1700	1623								
Volume to Capacity	0.00	0.01	0.00	0.00								
Queue Length 95th (ft)	0	1	0	0								
Control Delay (s)	0.0	8.4	0.0	7.2								
Lane LOS	A	A		A								
Approach Delay (s)	0.0	8.4	0.0	7.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.0									
Intersection Capacity Utilization			13.3%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Sherman Ave &

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	7	0	0	0	1	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.25	0.25	0.25	0.93	0.93	0.93	0.73	0.73	0.73
Hourly flow rate (vph)	0	0	0	0	0	28	0	0	0	1	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	31	3	0	3	3	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	31	3	0	3	3	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	97	100			100		
cM capacity (veh/h)	952	892	1085	1018	892	1085	1623			1623		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	28	0	1								
Volume Left	0	0	0	1								
Volume Right	0	28	0	0								
cSH	1700	1085	1700	1623								
Volume to Capacity	0.00	0.03	0.00	0.00								
Queue Length 95th (ft)	0	2	0	0								
Control Delay (s)	0.0	8.4	0.0	7.2								
Lane LOS	A	A		A								
Approach Delay (s)	0.0	8.4	0.0	7.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			13.3%		ICU Level of Service					A		
Analysis Period (min)			15									

Appendix E


















No-Build Synchro Output

FRESNO NO-BUILD CONDITIONS

HCM Unsignalized Intersection Capacity Analysis

1: Broadway St & Monterey St.


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	58	0	0	255	0	0	0	0	0	0	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	63	0	0	277	0	0	0	0	0	0	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	277			63			340	340	63	340	340	277
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			63			340	340	63	340	340	277
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	91
cM capacity (veh/h)	1286			1540			561	581	1002	614	581	762
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	63	277	0	0	65							
Volume Left	0	0	0	0	0							
Volume Right	0	0	0	0	65							
cSH	1286	1540	1700	1700	762							
Volume to Capacity	0.00	0.00	0.00	0.00	0.09							
Queue Length 95th (ft)	0	0	0	0	7							
Control Delay (s)	0.0	0.0	0.0	0.0	10.2							
Lane LOS			A	A	B							
Approach Delay (s)	0.0	0.0	0.0	10.2								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			23.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Broadway St & Monterey St.
















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	46	0	0	402	0	0	0	0	0	0	157
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	50	0	0	437	0	0	0	0	0	0	171
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	437			50			487	487	50	487	487	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	437			50			487	487	50	487	487	437
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	72
cM capacity (veh/h)	1123			1557			356	481	1018	491	481	620
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	50	437	0	0	171							
Volume Left	0	0	0	0	0							
Volume Right	0	0	0	0	171							
cSH	1123	1557	1700	1700	620							
Volume to Capacity	0.00	0.00	0.00	0.00	0.28							
Queue Length 95th (ft)	0	0	0	0	28							
Control Delay (s)	0.0	0.0	0.0	0.0	13.0							
Lane LOS			A	A	B							
Approach Delay (s)	0.0	0.0	0.0	13.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			37.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
















2: Van Ness Ave & San Benito St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	19	267	0	0	194	47	425	112	90	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	290	0	0	211	51	462	122	98	0	0	0
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2						
Volume Total (vph)	117	193	141	121	523	159						
Volume Left (vph)	21	0	0	0	462	0						
Volume Right (vph)	0	0	0	51	0	98						
Hadj (s)	0.12	0.03	0.03	-0.26	0.48	-0.40						
Departure Headway (s)	7.2	7.1	7.2	6.9	6.7	5.8						
Degree Utilization, x	0.24	0.38	0.28	0.23	0.97	0.26						
Capacity (veh/h)	492	501	493	514	527	601						
Control Delay (s)	11.3	13.3	11.9	10.9	56.8	9.6						
Approach Delay (s)	12.6		11.4		45.8							
Approach LOS	B		B		E							
Intersection Summary												
Delay			30.4									
HCM Level of Service			D									
Intersection Capacity Utilization			48.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2: Van Ness Ave & 41 NB Off-Ramp











4/25/2011

												
Movement	SBL2	SBL	SBR	NWL	NWR	NWR2	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop		Stop				Stop			Stop	
Volume (vph)	92	273	0	0	494	118	247	61	112	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	297	0	0	537	128	268	66	122	0	0	0
Direction, Lane #	SB 1	SB 2	NW 1	NW 2	NE 1	NE 2						
Volume Total (vph)	199	198	358	307	302	155						
Volume Left (vph)	100	0	0	0	268	0						
Volume Right (vph)	0	0	0	128	0	122						
Hadj (s)	0.29	0.03	0.03	-0.26	0.48	-0.52						
Departure Headway (s)	7.4	7.2	6.8	6.5	7.7	6.7						
Degree Utilization, x	0.41	0.39	0.68	0.56	0.64	0.29						
Capacity (veh/h)	466	482	511	527	445	514						
Control Delay (s)	14.3	13.6	21.9	16.2	22.2	11.1						
Approach Delay (s)	13.9		19.3		18.5							
Approach LOS	B		C		C							
Intersection Summary												
Delay			17.6									
HCM Level of Service			C									
Intersection Capacity Utilization			41.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: 41 SB Off-Ramp &











4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	666	59	0	6	808
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	724	64	0	7	878
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1132				
pX, platoon unblocked						
vC, conflicting volume	64				788	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64				788	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	12
cM capacity (veh/h)	1538				360	1000
Direction, Lane #	SE 1	NW 1	SW 1	SW 2		
Volume Total	724	64	7	878		
Volume Left	0	0	7	0		
Volume Right	0	0	0	878		
cSH	1700	1700	360	1000		
Volume to Capacity	0.43	0.04	0.02	0.88		
Queue Length 95th (ft)	0	0	1	302		
Control Delay (s)	0.0	0.0	15.2	27.8		
Lane LOS			C	D		
Approach Delay (s)	0.0	0.0	27.7			
Approach LOS			D			
Intersection Summary						
Average Delay			14.7			
Intersection Capacity Utilization			60.0%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: 41 SB Off-Ramp &

















4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	710	120	0	267	759
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	772	130	0	290	825
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1132				
pX, platoon unblocked					0.96	
vC, conflicting volume	130				902	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				879	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				5	10
cM capacity (veh/h)	1455				306	919
Direction, Lane #	SE 1	NW 1	SW 1	SW 2		
Volume Total	772	130	290	825		
Volume Left	0	0	290	0		
Volume Right	0	0	0	825		
cSH	1700	1700	306	919		
Volume to Capacity	0.45	0.08	0.95	0.90		
Queue Length 95th (ft)	0	0	237	317		
Control Delay (s)	0.0	0.0	76.8	31.8		
Lane LOS			F	D		
Approach Delay (s)	0.0	0.0	43.5			
Approach LOS			E			
Intersection Summary						
Average Delay			24.1			
Intersection Capacity Utilization			60.0%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Van Ness Ave & 41 SB Off-Ramp

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	271	335	102	412	0	0	0	0	170	452	575
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	295	364	111	448	0	0	0	0	185	491	625
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		735										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	448			659			1168	1146	477	1146	1328	224
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	448			624			1154	1132	435	1132	1321	224
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			0	100	100	0	0	20
cM capacity (veh/h)	1109			915			0	170	547	138	131	779
Direction, Lane #	SE 1	NW 1	NW 2	SW 1	SW 2							
Volume Total	659	260	299	884	417							
Volume Left	0	111	0	185	0							
Volume Right	364	0	0	208	417							
cSH	1700	915	1700	165	779							
Volume to Capacity	0.39	0.12	0.18	5.35	0.53							
Queue Length 95th (ft)	0	10	0	Err	80							
Control Delay (s)	0.0	4.8	0.0	Err	14.8							
Lane LOS		A		F	B							
Approach Delay (s)	0.0	2.2		6801.6								
Approach LOS				F								
Intersection Summary												
Average Delay			3514.3									
Intersection Capacity Utilization			104.0%		ICU Level of Service				G			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Van Ness Ave & 41 SB Off-Ramp




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	195	591	275	463	0	0	0	0	91	655	693
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	212	642	299	503	0	0	0	0	99	712	753
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		735										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	503			854			1739	1634	533	1634	1955	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	503			761			1773	1654	393	1654	2021	252
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			60			0	100	100	0	0	0
cM capacity (veh/h)	1057			740			0	51	529	39	30	748
Direction, Lane #	SE 1	NW 1	NW 2	SW 1	SW 2							
Volume Total	854	467	336	1062	502							
Volume Left	0	299	0	99	0							
Volume Right	642	0	0	251	502							
cSH	1700	740	1700	40	748							
Volume to Capacity	0.50	0.40	0.20	26.71	0.67							
Queue Length 95th (ft)	0	49	0	Err	131							
Control Delay (s)	0.0	10.5	0.0	Err	19.1							
Lane LOS		B		F	C							
Approach Delay (s)	0.0	6.1		6794.9								
Approach LOS				F								
Intersection Summary												
Average Delay			3301.5									
Intersection Capacity Utilization			131.0%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

5: SR99 S Off-ramp & Ventura Ave


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								 			 	
Volume (vph)	316	0	317	0	0	0	0	988	223	226	551	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2						5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00						0.95		1.00	0.95	
Frt	1.00	0.85						0.97		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583						3442		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.17	1.00	
Satd. Flow (perm)	1770	1583						3442		323	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	343	0	345	0	0	0	0	1074	242	246	599	0
RTOR Reduction (vph)	0	279	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	343	66	0	0	0	0	0	1300	0	246	599	0
Turn Type	Split									Perm		
Protected Phases	4	4						2			2	
Permitted Phases										2		
Actuated Green, G (s)	22.8	22.8						87.8		87.8	87.8	
Effective Green, g (s)	22.8	22.8						87.8		87.8	87.8	
Actuated g/C Ratio	0.19	0.19						0.73		0.73	0.73	
Clearance Time (s)	4.2	4.2						5.2		5.2	5.2	
Vehicle Extension (s)	5.2	5.2						0.2		0.2	0.2	
Lane Grp Cap (vph)	336	301						2518		236	2589	
v/s Ratio Prot	c0.19	0.04						0.38			0.17	
v/s Ratio Perm										c0.76		
v/c Ratio	1.02	0.22						0.52		1.04	0.23	
Uniform Delay, d1	48.6	41.1						6.9		16.1	5.2	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	54.5	0.8						0.1		70.1	0.0	
Delay (s)	103.1	41.9						7.0		86.2	5.2	
Level of Service	F	D						A		F	A	
Approach Delay (s)		72.4			0.0			7.0			28.8	
Approach LOS		E			A			A			C	
Intersection Summary												
HCM Average Control Delay			29.3		HCM Level of Service					C		
HCM Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				9.4			
Intersection Capacity Utilization			85.4%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: SR99 S Off-ramp & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	160	6	535	0	0	0	0	1069	183	442	1252	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2						5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00						0.95		1.00	0.95	
Frt	1.00	0.85						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	1587						3462		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.16	1.00	
Satd. Flow (perm)	1770	1587						3462		302	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	7	582	0	0	0	0	1162	199	480	1361	0
RTOR Reduction (vph)	0	76	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	174	513	0	0	0	0	0	1352	0	480	1361	0
Turn Type	Split									Perm		
Protected Phases	4	4						2			2	
Permitted Phases										2		
Actuated Green, G (s)	29.8	29.8						110.8		110.8	110.8	
Effective Green, g (s)	29.8	29.8						110.8		110.8	110.8	
Actuated g/C Ratio	0.20	0.20						0.74		0.74	0.74	
Clearance Time (s)	4.2	4.2						5.2		5.2	5.2	
Vehicle Extension (s)	5.2	5.2						0.2		0.2	0.2	
Lane Grp Cap (vph)	352	315						2557		223	2614	
v/s Ratio Prot	0.10	c0.32						0.39			0.38	
v/s Ratio Perm										c1.59		
v/c Ratio	0.49	1.63						0.53		2.15	0.52	
Uniform Delay, d1	53.4	60.1						8.4		19.6	8.3	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.4	296.8						0.1		533.3	0.1	
Delay (s)	55.8	356.9						8.5		552.9	8.4	
Level of Service	E	F						A		F	A	
Approach Delay (s)		288.2			0.0			8.5			150.4	
Approach LOS		F			A			A			F	
Intersection Summary												
HCM Average Control Delay			128.2			HCM Level of Service				F		
HCM Volume to Capacity ratio			2.04									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				9.4		
Intersection Capacity Utilization			105.5%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: SR99 N On-Ramp & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	115	24	426	386	922	0	0	672	214
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	125	26	463	420	1002	0	0	730	233
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								284			1117	
pX, platoon unblocked												
vC, conflicting volume	2663	2688	482	2207	2804	501	963			1002		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2663	2688	482	2207	2804	501	963			1002		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	100	0	0	10	41			100		
cM capacity (veh/h)	0	9	531	13	7	515	710			687		
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	138	476	420	501	501	487	476					
Volume Left	125	0	420	0	0	0	0					
Volume Right	0	463	0	0	0	0	233					
cSH	12	178	710	1700	1700	1700	1700					
Volume to Capacity	11.38	2.67	0.59	0.29	0.29	0.29	0.28					
Queue Length 95th (ft)	Err	1038	98	0	0	0	0					
Control Delay (s)	Err	807.9	17.1	0.0	0.0	0.0	0.0					
Lane LOS	F	F	C									
Approach Delay (s)	2873.9		5.0			0.0						
Approach LOS	F											
Intersection Summary												
Average Delay			590.9									
Intersection Capacity Utilization			85.4%		ICU Level of Service					E		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: SR99 N On-Ramp & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	300	5	374	314	913	0	0	1321	408
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	326	5	407	341	992	0	0	1436	443
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								284			1117	
pX, platoon unblocked	0.85	0.85	0.79	0.85	0.85	0.87	0.79			0.87		
vC, conflicting volume	3246	3333	940	2393	3554	496	1879			992		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2605	2707	391	1607	2967	124	1581			694		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	100	0	0	48	0			100		
cM capacity (veh/h)	0	0	480	0	0	787	325			781		
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	329	409	341	496	496	957	922					
Volume Left	326	0	341	0	0	0	0					
Volume Right	0	407	0	0	0	0	443					
cSH	0	0	325	1700	1700	1700	1700					
Volume to Capacity	Err	Err	1.05	0.29	0.29	0.56	0.54					
Queue Length 95th (ft)	Err	Err	309	0	0	0	0					
Control Delay (s)	Err	Err	100.1	0.0	0.0	0.0	0.0					
Lane LOS	F	F	F									
Approach Delay (s)	Err		25.6			0.0						
Approach LOS	F											
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			105.5%		ICU Level of Service				G			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: E St & Ventura Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	21	4	38	49	19	13	190	1147	3	1	810	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	4	41	53	21	14	207	1247	3	1	880	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								595			806	
pX, platoon unblocked	0.97	0.97	0.97	0.97	0.97		0.97					
vC, conflicting volume	1960	2562	457	2147	2577	625	913			1250		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1923	2546	366	2117	2562	625	839			1250		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	77	93	0	0	97	73			100		
cM capacity (veh/h)	0	19	609	17	18	428	764			553		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	68	88	830	627	441	473						
Volume Left	23	53	207	0	1	0						
Volume Right	41	14	0	3	0	33						
cSH	0	20	764	1700	553	1700						
Volume to Capacity	Err	4.31	0.27	0.37	0.00	0.28						
Queue Length 95th (ft)	Err	Err	27	0	0	0						
Control Delay (s)	Err	Err	6.5	0.0	0.1	0.0						
Lane LOS	F	F	A		A							
Approach Delay (s)	Err	Err	3.7		0.0							
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			78.6%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: E St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	33	5	93	250	162	153	274	994	82	6	1229	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	5	101	272	176	166	298	1080	89	7	1336	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								595			806	
pX, platoon unblocked	0.77	0.77	0.73	0.77	0.77	0.91	0.73			0.91		
vC, conflicting volume	2755	3130	684	2505	3102	585	1368			1170		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2143	2627	0	1821	2591	337	759			982		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	42	87	0	0	72	52			99		
cM capacity (veh/h)	0	9	790	11	10	598	618			634		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	142	614	838	629	674	701						
Volume Left	36	272	298	0	7	0						
Volume Right	101	166	0	89	0	33						
cSH	0	15	618	1700	634	1700						
Volume to Capacity	Err	41.98	0.48	0.37	0.01	0.41						
Queue Length 95th (ft)	Err	Err	66	0	1	0						
Control Delay (s)	Err	Err	13.1	0.0	0.3	0.0						
Lane LOS	F	F	B		A							
Approach Delay (s)	Err	Err	7.5		0.1							
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			121.5%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

8: G St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	34	82	29	50	107	72	41	1043	48	38	741	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1789		1770	1750		1770	3516		1770	3515	
Flt Permitted	0.63	1.00		0.68	1.00		0.30	1.00		0.18	1.00	
Satd. Flow (perm)	1178	1789		1265	1750		561	3516		332	3515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	89	32	54	116	78	45	1134	52	41	805	39
RTOR Reduction (vph)	0	24	0	0	42	0	0	5	0	0	6	0
Lane Group Flow (vph)	37	97	0	54	152	0	45	1181	0	41	838	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	13.0	13.0		13.0	13.0		29.1	29.1		29.1	29.1	
Effective Green, g (s)	13.0	13.0		13.0	13.0		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.57	0.57		0.57	0.57	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	301	458		324	448		321	2014		190	2014	
v/s Ratio Prot		0.05			c0.09			c0.34			0.24	
v/s Ratio Perm	0.03			0.04			0.08			0.12		
v/c Ratio	0.12	0.21		0.17	0.34		0.14	0.59		0.22	0.42	
Uniform Delay, d1	14.5	14.9		14.7	15.4		5.0	7.0		5.3	6.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5		0.5	0.9		0.4	0.7		1.2	0.3	
Delay (s)	14.9	15.4		15.2	16.3		5.5	7.7		6.5	6.4	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		15.3			16.1			7.6			6.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			8.5			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			50.8			Sum of lost time (s)			8.7			
Intersection Capacity Utilization			69.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: G St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	147	88	69	255	88	105	978	54	99	1101	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1758		1770	1791		1770	3511		1770	3471	
Flt Permitted	0.38	1.00		0.55	1.00		0.14	1.00		0.17	1.00	
Satd. Flow (perm)	716	1758		1017	1791		263	3511		325	3471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	160	96	75	277	96	114	1063	59	108	1197	176
RTOR Reduction (vph)	0	32	0	0	23	0	0	7	0	0	21	0
Lane Group Flow (vph)	141	224	0	75	350	0	114	1115	0	108	1352	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	18.0	18.0		18.0	18.0		28.3	28.3		28.3	28.3	
Effective Green, g (s)	18.0	18.0		18.0	18.0		28.3	28.3		28.3	28.3	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.51	0.51		0.51	0.51	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	234	575		333	586		135	1807		167	1786	
v/s Ratio Prot		0.13			0.20			0.32			0.39	
v/s Ratio Perm	c0.20			0.07			c0.43			0.33		
v/c Ratio	0.60	0.39		0.23	0.60		0.84	0.62		0.65	0.76	
Uniform Delay, d1	15.5	14.3		13.4	15.5		11.5	9.5		9.7	10.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.3	0.9		0.7	2.5		38.6	0.9		11.2	2.2	
Delay (s)	21.8	15.2		14.2	17.9		50.1	10.4		20.9	12.9	
Level of Service	C	B		B	B		D	B		C	B	
Approach Delay (s)		17.5			17.3			14.1			13.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			14.6			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			55.0							8.7		
Intersection Capacity Utilization			104.7%							G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Broadway St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	221	501	49	326	553	28	27	711	383	57	715	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3492		1770	1849		1770	3353		1770	3499	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3492		1770	1849		1770	3353		1770	3499	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	240	545	53	354	601	30	29	773	416	62	777	64
RTOR Reduction (vph)	0	5	0	0	1	0	0	49	0	0	4	0
Lane Group Flow (vph)	240	593	0	354	630	0	29	1140	0	62	837	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	23.8	23.8		46.5	46.5		4.7	48.2		6.3	49.8	
Effective Green, g (s)	23.8	23.8		46.5	46.5		4.7	48.2		6.3	49.8	
Actuated g/C Ratio	0.17	0.17		0.32	0.32		0.03	0.33		0.04	0.35	
Clearance Time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	292	576		571	596		58	1121		77	1208	
v/s Ratio Prot	0.14	c0.17		0.20	c0.34		0.02	c0.34		c0.04	0.24	
v/s Ratio Perm												
v/c Ratio	0.82	1.03		0.62	1.06		0.50	1.02		0.81	0.69	
Uniform Delay, d1	58.2	60.2		41.4	48.8		68.6	48.0		68.3	40.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.0	45.3		1.4	52.7		2.5	31.3		41.9	1.4	
Delay (s)	74.2	105.5		42.8	101.5		71.1	79.3		110.2	42.0	
Level of Service	E	F		D	F		E	E		F	D	
Approach Delay (s)		96.5			80.4			79.1			46.7	
Approach LOS		F			F			E			D	
Intersection Summary												
HCM Average Control Delay			75.7			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			144.2			Sum of lost time (s)			19.4			
Intersection Capacity Utilization			97.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Broadway St & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	197	769	79	273	386	57	154	815	342	121	996	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3490		1770	1827		1770	3382		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3490		1770	1827		1770	3382		1770	3479	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	836	86	297	420	62	167	886	372	132	1083	138
RTOR Reduction (vph)	0	5	0	0	4	0	0	34	0	0	7	0
Lane Group Flow (vph)	214	917	0	297	478	0	167	1224	0	132	1214	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	30.4	30.4		31.4	31.4		10.0	45.8		8.0	43.8	
Effective Green, g (s)	30.4	30.4		31.4	31.4		10.0	45.8		8.0	43.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.07	0.34		0.06	0.32	
Clearance Time (s)	5.6	5.6		5.6	5.6		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	399	786		412	425		131	1147		105	1129	
v/s Ratio Prot	0.12	c0.26		0.17	c0.26		c0.09	c0.36		0.07	0.35	
v/s Ratio Perm												
v/c Ratio	0.54	1.17		0.72	1.13		1.27	1.07		1.26	1.07	
Uniform Delay, d1	46.1	52.3		47.8	51.8		62.5	44.6		63.5	45.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	88.4		5.2	82.3		170.0	46.3		172.1	49.3	
Delay (s)	46.8	140.7		53.0	134.1		232.5	90.9		235.6	94.9	
Level of Service	D	F		D	F		F	F		F	F	
Approach Delay (s)		123.0			103.2			107.5			108.7	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			110.9			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			135.0			Sum of lost time (s)			15.2			
Intersection Capacity Utilization			95.2%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Van Ness Ave & Ventura Ave





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	32	191	56	254	465	194	61	706	159	189	543	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2		4.2	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3419		1770	3383		1770	3442		1770	3454	
Flt Permitted	0.23	1.00		0.59	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	435	3419		1092	3383		1770	3442		1770	3454	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	208	61	276	505	211	66	767	173	205	590	113
RTOR Reduction (vph)	0	42	0	0	72	0	0	29	0	0	22	0
Lane Group Flow (vph)	35	227	0	276	644	0	66	911	0	205	681	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	20.0	20.0		20.0	20.0		5.0	23.7		8.8	27.5	
Effective Green, g (s)	20.0	20.0		20.0	20.0		5.0	23.7		8.8	27.5	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.08	0.37		0.14	0.42	
Clearance Time (s)	4.2	4.2		4.2	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	4.8	4.8		4.8	4.8		2.0	4.8		2.0	4.8	
Lane Grp Cap (vph)	134	1054		337	1043		136	1257		240	1464	
v/s Ratio Prot		0.07			0.19		0.04	c0.26		c0.12	0.20	
v/s Ratio Perm	0.08			c0.25								
v/c Ratio	0.26	0.22		0.82	0.62		0.49	0.72		0.85	0.47	
Uniform Delay, d1	16.9	16.6		20.8	19.2		28.7	17.8		27.4	13.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.2		15.9	1.5		1.0	2.5		23.6	0.5	
Delay (s)	18.9	16.8		36.6	20.7		29.7	20.3		51.0	13.9	
Level of Service	B	B		D	C		C	C		D	B	
Approach Delay (s)		17.1			25.1			20.9			22.3	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay			22.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			64.9			Sum of lost time (s)				12.4		
Intersection Capacity Utilization			74.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Van Ness Ave & Ventura Ave

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	148	438	101	480	481	176	58	862	171	97	707	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2		4.2	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3440		1770	3397		1770	3451		1770	3482	
Flt Permitted	0.32	1.00		0.38	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	598	3440		713	3397		1770	3451		1770	3482	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	476	110	522	523	191	63	937	186	105	768	93
RTOR Reduction (vph)	0	14	0	0	25	0	0	11	0	0	6	0
Lane Group Flow (vph)	161	572	0	522	689	0	63	1112	0	105	855	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases	4			8			5			1		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	84.8	84.8		84.8	84.8		9.6	41.6		12.0	44.0	
Effective Green, g (s)	84.8	84.8		84.8	84.8		9.6	41.6		12.0	44.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.06	0.28		0.08	0.29	
Clearance Time (s)	4.2	4.2		4.2	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	4.8	4.8		4.8	4.8		2.0	4.8		2.0	4.8	
Lane Grp Cap (vph)	336	1934		401	1910		113	952		141	1016	
v/s Ratio Prot		0.17			0.20		0.04	c0.32		0.06	c0.25	
v/s Ratio Perm	0.27			c0.73								
v/c Ratio	0.48	0.30		1.30	0.36		0.56	1.17		0.74	0.84	
Uniform Delay, d1	19.8	17.3		33.0	18.1		68.5	54.6		67.9	50.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.2		153.0	0.2		3.4	87.1		16.9	7.0	
Delay (s)	21.9	17.5		186.0	18.3		71.9	141.7		84.8	57.1	
Level of Service	C	B		F	B		E	F		F	E	
Approach Delay (s)		18.4			89.1			138.0			60.1	
Approach LOS		B			F			F			E	


















Intersection Summary

HCM Average Control Delay	83.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	150.8	Sum of lost time (s)	12.6
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

11: M St & Ventura Ave


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	37	440	151	0	0	0	0	833	98	24	766	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.98		1.00	1.00	
Flt Protected		1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5066	1583					3483		1770	3539	
Flt Permitted		1.00	1.00					1.00		0.20	1.00	
Satd. Flow (perm)		5066	1583					3483		368	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	478	164	0	0	0	0	905	107	26	833	0
RTOR Reduction (vph)	0	0	69	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	518	95	0	0	0	0	997	0	26	833	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4							6		
Actuated Green, G (s)		20.0	20.0					25.6		25.6	25.6	
Effective Green, g (s)		20.0	20.0					25.6		25.6	25.6	
Actuated g/C Ratio		0.37	0.37					0.47		0.47	0.47	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		2.0	2.0					2.0		2.0	2.0	
Lane Grp Cap (vph)		1876	586					1651		174	1678	
v/s Ratio Prot		c0.10						c0.29			0.24	
v/s Ratio Perm			0.06							0.07		
v/c Ratio		0.28	0.16					0.60		0.15	0.50	
Uniform Delay, d1		11.9	11.4					10.5		8.0	9.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0					0.4		0.1	0.1	
Delay (s)		12.0	11.4					10.9		8.2	9.9	
Level of Service		B	B					B		A	A	
Approach Delay (s)		11.8			0.0			10.9			9.8	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM Average Control Delay			10.8									HCM Level of Service B
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			54.0							8.4		
Intersection Capacity Utilization			49.8%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: M St & Ventura Ave

























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	150	1766	46	0	0	0	0	1124	48	73	913	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.99		1.00	1.00	
Flt Protected		1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5065	1583					3518		1770	3539	
Flt Permitted		1.00	1.00					1.00		0.15	1.00	
Satd. Flow (perm)		5065	1583					3518		274	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1920	50	0	0	0	0	1222	52	79	992	0
RTOR Reduction (vph)	0	0	20	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	2083	30	0	0	0	0	1272	0	79	992	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4							6		
Actuated Green, G (s)		28.8	28.8					27.2		27.2	27.2	
Effective Green, g (s)		28.8	28.8					27.2		27.2	27.2	
Actuated g/C Ratio		0.45	0.45					0.42		0.42	0.42	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		2.0	2.0					2.0		2.0	2.0	
Lane Grp Cap (vph)		2265	708					1486		116	1495	
v/s Ratio Prot		c0.41						c0.36			0.28	
v/s Ratio Perm			0.02							0.29		
v/c Ratio		0.92	0.04					0.86		0.68	0.66	
Uniform Delay, d1		16.7	10.0					16.8		15.1	14.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		6.5	0.0					4.9		12.3	0.9	
Delay (s)		23.2	10.0					21.7		27.4	15.8	
Level of Service		C	B					C		C	B	
Approach Delay (s)		22.9			0.0			21.7			16.7	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM Average Control Delay			21.1									
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			64.4							8.4		
Intersection Capacity Utilization			101.1%							G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: O St & Ventura Ave

























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	79	43	37	154	324	17	85	723	4	25	696	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	47	40	167	352	18	92	786	4	27	757	40
RTOR Reduction (vph)	0	0	35	0	0	13	0	0	3	0	0	28
Lane Group Flow (vph)	86	47	5	167	352	5	92	786	1	27	757	12
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	5		6	6		3	8		7	4	
Permitted Phases			5			6			8			4
Actuated Green, G (s)	8.5	8.5	8.5	18.6	18.6	18.6	5.6	25.0	25.0	2.4	21.8	21.8
Effective Green, g (s)	8.5	8.5	8.5	18.6	18.6	18.6	5.6	25.0	25.0	2.4	21.8	21.8
Actuated g/C Ratio	0.12	0.12	0.12	0.26	0.26	0.26	0.08	0.35	0.35	0.03	0.31	0.31
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Vehicle Extension (s)	4.9	4.9	4.9	4.9	4.9	4.9	2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	212	223	189	898	487	414	139	1244	557	60	1085	485
v/s Ratio Prot	c0.05	0.03		0.05	c0.19		c0.05	c0.22		0.02	0.21	
v/s Ratio Perm			0.00			0.00			0.00			0.01
v/c Ratio	0.41	0.21	0.03	0.19	0.72	0.01	0.66	0.63	0.00	0.45	0.70	0.03
Uniform Delay, d1	29.0	28.3	27.6	20.4	23.9	19.4	31.8	19.2	15.0	33.7	21.7	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	1.0	0.1	0.2	6.3	0.0	8.8	1.4	0.0	1.9	2.5	0.0
Delay (s)	31.5	29.2	27.8	20.6	30.2	19.5	40.6	20.7	15.0	35.7	24.2	17.3
Level of Service	C	C	C	C	C	B	D	C	B	D	C	B
Approach Delay (s)		30.0			26.9			22.7			24.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.7									
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			71.1									
Intersection Capacity Utilization			62.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: O St & Ventura Ave



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	183	303	162	97	265	47	58	1139	68	67	758	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	329	176	105	288	51	63	1238	74	73	824	51
RTOR Reduction (vph)	0	0	65	0	0	41	0	0	32	0	0	30
Lane Group Flow (vph)	199	329	111	105	288	10	63	1238	42	73	824	21
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	5		6	6		3	8		7	4	
Permitted Phases			5			6			8			4
Actuated Green, G (s)	20.2	20.2	20.2	19.4	19.4	19.4	9.1	29.3	29.3	9.1	29.3	29.3
Effective Green, g (s)	20.2	20.2	20.2	19.4	19.4	19.4	9.1	29.3	29.3	9.1	29.3	29.3
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.10	0.31	0.31	0.10	0.31	0.31
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	4.0	4.2	4.2	4.0	4.2	4.2
Vehicle Extension (s)	4.9	4.9	4.9	4.9	4.9	4.9	2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	378	398	338	704	382	325	170	1096	490	170	1096	490
v/s Ratio Prot	0.11	c0.18		0.03	c0.15		0.04	c0.35		c0.04	0.23	
v/s Ratio Perm			0.07			0.01			0.03			0.01
v/c Ratio	0.53	0.83	0.33	0.15	0.75	0.03	0.37	1.13	0.08	0.43	0.75	0.04
Uniform Delay, d1	33.0	35.5	31.5	30.8	35.4	30.1	40.1	32.6	23.1	40.3	29.4	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	14.5	1.1	0.2	9.6	0.1	0.5	70.2	0.2	0.6	3.5	0.1
Delay (s)	35.4	50.1	32.6	31.0	44.9	30.2	40.6	102.8	23.3	40.9	32.9	22.9
Level of Service	D	D	C	C	D	C	D	F	C	D	C	C
Approach Delay (s)		41.6			40.0			95.7			32.9	
Approach LOS		D			D			F			C	
Intersection Summary												
HCM Average Control Delay			60.5									
HCM Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			94.6									
Intersection Capacity Utilization			81.3%									
Analysis Period (min)			15									
c Critical Lane Group												
<div> <div>HCM Level of Service</div> <div>E</div> </div> <div> <div>Sum of lost time (s)</div> <div>16.6</div> </div> <div> <div>ICU Level of Service</div> <div>D</div> </div>												

HCM Signalized Intersection Capacity Analysis

13: P St & Ventura Ave


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	35	104	112	162	654	0	0	740	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					4.2	4.2	4.2	4.2			4.2	4.2
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3495	1583	1770	3539			3539	1583
Flt Permitted					0.99	1.00	0.34	1.00			1.00	1.00
Satd. Flow (perm)					3495	1583	642	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	38	113	122	176	711	0	0	804	441
RTOR Reduction (vph)	0	0	0	0	0	102	0	0	0	0	0	169
Lane Group Flow (vph)	0	0	0	0	151	20	176	711	0	0	804	272
Turn Type				Split		Perm	Perm					Perm
Protected Phases				8	8			2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)					6.0	6.0	23.1	23.1			23.1	23.1
Effective Green, g (s)					6.0	6.0	23.1	23.1			23.1	23.1
Actuated g/C Ratio					0.16	0.16	0.62	0.62			0.62	0.62
Clearance Time (s)					4.2	4.2	4.2	4.2			4.2	4.2
Vehicle Extension (s)					2.0	2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)					559	253	395	2180			2180	975
v/s Ratio Prot					c0.04			0.20			0.23	
v/s Ratio Perm						0.01	c0.27					0.17
v/c Ratio					0.27	0.08	0.45	0.33			0.37	0.28
Uniform Delay, d1					13.8	13.4	3.8	3.5			3.6	3.3
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					0.1	0.0	0.3	0.0			0.0	0.1
Delay (s)					13.9	13.4	4.1	3.5			3.6	3.4
Level of Service					B	B	A	A			A	A
Approach Delay (s)		0.0			13.7			3.6			3.5	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			4.7		HCM Level of Service					A		
HCM Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			37.5						8.4			
Intersection Capacity Utilization			59.0%						B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: P St & Ventura Ave























4/25/2011

											
Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Volume (vph)	31	168	254	0	0	231	1144	0	0	843	441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2			4.2	4.2			4.2	4.2
Lane Util. Factor		0.97	1.00			1.00	0.95			0.95	1.00
Frt		1.00	0.85			1.00	1.00			1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)		3433	1583			1770	3539			3539	1583
Flt Permitted		0.95	1.00			0.28	1.00			1.00	1.00
Satd. Flow (perm)		3433	1583			522	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	183	276	0	0	251	1243	0	0	916	479
RTOR Reduction (vph)	0	0	62	0	0	0	0	0	0	0	163
Lane Group Flow (vph)	0	217	214	0	0	251	1243	0	0	916	316
Turn Type	Split		Perm			Perm					Perm
Protected Phases	8	8					2			6	
Permitted Phases			8			2					6
Actuated Green, G (s)		13.4	13.4			37.6	37.6			37.6	37.6
Effective Green, g (s)		13.4	13.4			37.6	37.6			37.6	37.6
Actuated g/C Ratio		0.23	0.23			0.63	0.63			0.63	0.63
Clearance Time (s)		4.2	4.2			4.2	4.2			4.2	4.2
Vehicle Extension (s)		2.0	2.0			2.0	2.0			2.0	2.0
Lane Grp Cap (vph)		774	357			330	2240			2240	1002
v/s Ratio Prot		0.06					0.35			0.26	
v/s Ratio Perm			c0.14			c0.48					0.20
v/c Ratio		0.28	0.60			0.76	0.55			0.41	0.32
Uniform Delay, d1		19.0	20.6			7.7	6.2			5.4	5.0
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00
Incremental Delay, d2		0.1	1.8			9.0	0.2			0.0	0.1
Delay (s)		19.1	22.4			16.7	6.3			5.4	5.1
Level of Service		B	C			B	A			A	A
Approach Delay (s)		20.9		0.0			8.1			5.3	
Approach LOS		C		A			A			A	
Intersection Summary											
HCM Average Control Delay			8.8			HCM Level of Service				A	
HCM Volume to Capacity ratio			0.72								
Actuated Cycle Length (s)			59.4			Sum of lost time (s)			8.4		
Intersection Capacity Utilization			57.1%			ICU Level of Service			B		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

14: Ventura Ave & S 1st St























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	124	596	7	12	1079	153	14	142	5	183	128	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5076		1770	5085	1583	1770	3523		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.67	1.00		0.65	1.00	1.00
Satd. Flow (perm)	1770	5076		1770	5085	1583	1245	3523		1213	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	648	8	13	1173	166	15	154	5	199	139	284
RTOR Reduction (vph)	0	1	0	0	0	66	0	4	0	0	0	203
Lane Group Flow (vph)	135	655	0	13	1173	100	15	155	0	199	139	81
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	7.1	34.7		1.0	28.6	28.6	15.2	15.2		15.2	15.2	15.2
Effective Green, g (s)	7.1	34.7		1.0	28.6	28.6	15.2	15.2		15.2	15.2	15.2
Actuated g/C Ratio	0.11	0.54		0.02	0.45	0.45	0.24	0.24		0.24	0.24	0.24
Clearance Time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	196	2748		28	2269	706	295	835		288	442	375
v/s Ratio Prot	c0.08	0.13		0.01	c0.23			0.04			0.07	
v/s Ratio Perm						0.06	0.01			c0.16		0.05
v/c Ratio	0.69	0.24		0.46	0.52	0.14	0.05	0.19		0.69	0.31	0.22
Uniform Delay, d1	27.4	7.7		31.3	12.8	10.5	18.9	19.5		22.3	20.2	19.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.8	0.0		4.4	0.1	0.0	0.0	0.0		5.7	0.1	0.1
Delay (s)	35.2	7.8		35.7	12.9	10.5	18.9	19.6		28.0	20.3	19.8
Level of Service	D	A		D	B	B	B	B		C	C	B
Approach Delay (s)		12.4			12.8			19.5			22.5	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay			15.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			64.1			Sum of lost time (s)				13.2		
Intersection Capacity Utilization			59.4%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Ventura Ave & S 1st St










4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	1555	17	39	1318	468	26	312	28	408	294	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5077		1770	5085	1583	1770	3496		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.45	1.00		0.50	1.00	1.00
Satd. Flow (perm)	1770	5077		1770	5085	1583	843	3496		935	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	1690	18	42	1433	509	28	339	30	443	320	350
RTOR Reduction (vph)	0	1	0	0	0	160	0	7	0	0	0	163
Lane Group Flow (vph)	313	1707	0	42	1433	349	28	362	0	443	320	187
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	13.0	37.6		4.4	29.0	29.0	36.4	36.4		36.4	36.4	36.4
Effective Green, g (s)	13.0	37.6		4.4	29.0	29.0	36.4	36.4		36.4	36.4	36.4
Actuated g/C Ratio	0.14	0.41		0.05	0.32	0.32	0.40	0.40		0.40	0.40	0.40
Clearance Time (s)	4.0	4.6		4.0	4.6	4.6	4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	251	2084		85	1610	501	335	1389		372	740	629
v/s Ratio Prot	c0.18	0.34		0.02	c0.28			0.10			0.17	
v/s Ratio Perm						0.22	0.03			c0.47		0.12
v/c Ratio	1.25	0.82		0.49	0.89	0.70	0.08	0.26		1.19	0.43	0.30
Uniform Delay, d1	39.3	24.0		42.5	29.8	27.4	17.2	18.6		27.6	20.1	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	139.9	2.5		1.6	6.4	3.4	0.0	0.0		109.6	0.1	0.1
Delay (s)	179.2	26.5		44.2	36.2	30.8	17.2	18.6		137.2	20.2	19.0
Level of Service	F	C		D	D	C	B	B		F	C	B
Approach Delay (s)		50.1			35.0			18.5			66.4	
Approach LOS		D			D			B			E	
Intersection Summary												
HCM Average Control Delay			45.7			HCM Level of Service				D		
HCM Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			91.6			Sum of lost time (s)				13.2		
Intersection Capacity Utilization			88.4%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

15: G St & Inyo St










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	146	0	18	171	16	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	159	0	20	186	17	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	484			1038		
pX, platoon unblocked						
vC, conflicting volume			159		384	159
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		384	159
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	100
cM capacity (veh/h)			1421		611	887
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	159	205	22			
Volume Left	0	20	17			
Volume Right	0	0	4			
cSH	1700	1421	651			
Volume to Capacity	0.09	0.01	0.03			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	0.8	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			31.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

15: G St & Inyo St













4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	363	0	22	514	27	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	395	0	24	559	29	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	484			1038		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			395		1001	395
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			306		961	306
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	99
cM capacity (veh/h)			1162		258	680
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	395	583	37			
Volume Left	0	24	29			
Volume Right	0	0	8			
cSH	1700	1162	296			
Volume to Capacity	0.23	0.02	0.13			
Queue Length 95th (ft)	0	2	11			
Control Delay (s)	0.0	0.6	18.9			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.6	18.9			
Approach LOS			C			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			54.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

16: H St & Inyo St













4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	632	102	176	161	7	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2	4.2	4.2	4.2	4.2
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	687	111	191	175	8	249
RTOR Reduction (vph)	0	0	0	143	0	217
Lane Group Flow (vph)	687	111	191	32	8	32
Turn Type	Prot			Perm		Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	29.1	44.3	11.2	11.2	7.7	7.7
Effective Green, g (s)	29.1	44.3	11.2	11.2	7.7	7.7
Actuated g/C Ratio	0.48	0.73	0.19	0.19	0.13	0.13
Clearance Time (s)	4.0	4.2	4.2	4.2	4.2	4.2
Vehicle Extension (s)	3.0	4.8	4.8	4.8	2.0	2.0
Lane Grp Cap (vph)	853	2596	656	294	226	202
v/s Ratio Prot	c0.39	0.03	c0.05		0.00	
v/s Ratio Perm				0.02		c0.02
v/c Ratio	0.81	0.04	0.29	0.11	0.04	0.16
Uniform Delay, d1	13.3	2.2	21.2	20.5	23.1	23.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.0	0.5	0.3	0.0	0.1
Delay (s)	18.8	2.2	21.7	20.8	23.1	23.6
Level of Service	B	A	C	C	C	C
Approach Delay (s)		16.5	21.2		23.6	
Approach LOS		B	C		C	
Intersection Summary						
HCM Average Control Delay			19.0		HCM Level of Service	B
HCM Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			60.4		Sum of lost time (s)	12.4
Intersection Capacity Utilization			57.0%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

16: H St & Inyo St





















4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	500	211	109	89	91	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2	4.2	4.2	4.2	4.2
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	229	118	97	99	546
RTOR Reduction (vph)	0	0	0	84	0	451
Lane Group Flow (vph)	543	229	118	13	99	95
Turn Type	Prot			Perm		Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	25.2	36.4	7.2	7.2	9.4	9.4
Effective Green, g (s)	25.2	36.4	7.2	7.2	9.4	9.4
Actuated g/C Ratio	0.46	0.67	0.13	0.13	0.17	0.17
Clearance Time (s)	4.0	4.2	4.2	4.2	4.2	4.2
Vehicle Extension (s)	3.0	4.8	4.8	4.8	2.0	2.0
Lane Grp Cap (vph)	823	2377	470	210	307	275
v/s Ratio Prot	c0.31	0.06	c0.03		0.06	
v/s Ratio Perm				0.01		c0.06
v/c Ratio	0.66	0.10	0.25	0.06	0.32	0.34
Uniform Delay, d1	11.2	3.1	21.1	20.5	19.6	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.0	0.5	0.2	0.2	0.3
Delay (s)	13.1	3.2	21.6	20.8	19.8	20.0
Level of Service	B	A	C	C	B	B
Approach Delay (s)		10.2	21.2		19.9	
Approach LOS		B	C		B	
Intersection Summary						
HCM Average Control Delay			15.5		HCM Level of Service	B
HCM Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			54.2		Sum of lost time (s)	12.4
Intersection Capacity Utilization			47.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

17: Van Ness Ave & Inyo St





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	5	222	48	141	455	54	98	205	77	13	111	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3445		1770	3483		1770	1786		1770	1828	
Flt Permitted	0.42	1.00		0.57	1.00		0.67	1.00		0.50	1.00	
Satd. Flow (perm)	775	3445		1067	3483		1246	1786		929	1828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	241	52	153	495	59	107	223	84	14	121	17
RTOR Reduction (vph)	0	28	0	0	16	0	0	22	0	0	9	0
Lane Group Flow (vph)	5	265	0	153	538	0	107	285	0	14	129	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	26.0	26.0		26.0	26.0		22.0	22.0		22.0	22.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0		22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.39	0.39		0.39	0.39	
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	357	1588		492	1606		486	697		362	713	
v/s Ratio Prot		0.08			0.15			0.16			0.07	
v/s Ratio Perm	0.01			0.14			0.09			0.02		
v/c Ratio	0.01	0.17		0.31	0.34		0.22	0.41		0.04	0.18	
Uniform Delay, d1	8.2	8.9		9.6	9.7		11.5	12.5		10.7	11.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.0		0.1	0.1		0.0	0.0	
Delay (s)	8.3	8.9		9.7	9.7		11.6	12.6		10.7	11.3	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		8.9			9.7			12.3			11.3	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			10.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			56.4			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			94.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: Van Ness Ave & Inyo St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	84	425	113	66	361	114	74	265	50	99	411	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3412		1770	1819		1770	1776	
Flt Permitted	0.44	1.00		0.39	1.00		0.17	1.00		0.46	1.00	
Satd. Flow (perm)	813	3428		732	3412		323	1819		861	1776	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	462	123	72	392	124	80	288	54	108	447	200
RTOR Reduction (vph)	0	41	0	0	51	0	0	11	0	0	26	0
Lane Group Flow (vph)	91	544	0	72	465	0	80	331	0	108	621	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	26.0	26.0		26.0	26.0		23.1	23.1		23.1	23.1	
Effective Green, g (s)	26.0	26.0		26.0	26.0		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.2	4.2		4.2	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	368	1550		331	1543		130	731		346	713	
v/s Ratio Prot		c0.16			0.14			0.18			c0.35	
v/s Ratio Perm	0.11			0.10			0.25			0.13		
v/c Ratio	0.25	0.35		0.22	0.30		0.62	0.45		0.31	0.87	
Uniform Delay, d1	9.7	10.3		9.6	10.0		13.7	12.6		11.8	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.0		6.0	0.2		0.2	10.9	
Delay (s)	9.8	10.3		9.7	10.0		19.6	12.7		12.0	26.8	
Level of Service	A	B		A	B		B	B		B	C	
Approach Delay (s)		10.2			10.0			14.0			24.6	
Approach LOS		B			A			B			C	
Intersection Summary												
HCM Average Control Delay			15.3			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			57.5			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			108.5%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

















18: M St & Inyo St

Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis

18: M St & Inyo St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	109	1362	252	0	0	0	0	292	294	81	391	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5						4.5		4.5	4.5	
Lane Util. Factor		0.91						1.00		1.00	1.00	
Frt		0.98						0.93		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4958						1736		1770	1863	
Flt Permitted		1.00						1.00		0.18	1.00	
Satd. Flow (perm)		4958						1736		342	1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	1480	274	0	0	0	0	317	320	88	425	0
RTOR Reduction (vph)	0	44	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1828	0	0	0	0	0	632	0	88	425	0
Turn Type	Split									Perm		
Protected Phases	2	2						8			4	
Permitted Phases										4		
Actuated Green, G (s)		23.0						23.0		23.0	23.0	
Effective Green, g (s)		23.0						23.0		23.0	23.0	
Actuated g/C Ratio		0.42						0.42		0.42	0.42	
Clearance Time (s)		4.5						4.5		4.5	4.5	
Vehicle Extension (s)		0.2						0.2		0.2	0.2	
Lane Grp Cap (vph)		2073						726		143	779	
v/s Ratio Prot		c0.37						c0.36			0.23	
v/s Ratio Perm										0.26		
v/c Ratio		0.88						0.87		0.62	0.55	
Uniform Delay, d1		14.7						14.6		12.5	12.1	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		4.7						10.8		5.4	0.4	
Delay (s)		19.4						25.5		18.0	12.5	
Level of Service		B						C		B	B	
Approach Delay (s)		19.4			0.0			25.5			13.4	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM Average Control Delay			19.7		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)					9.0		
Intersection Capacity Utilization			90.6%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

19: P St & Inyo St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	127	444	17	14	9	0	0	19	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	138	483	18	15	10	0	0	21	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1000			1010							
pX, platoon unblocked												
vC, conflicting volume	501			0			535	777	0	773	768	251
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	501			0			535	777	0	773	768	251
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			96	97	100	100	93	99
cM capacity (veh/h)	1059			1622			376	299	1084	263	302	749
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	SW 1							
Volume Total	379	260	15	10	28							
Volume Left	138	0	15	0	0							
Volume Right	0	18	0	0	8							
cSH	1622	1700	376	299	360							
Volume to Capacity	0.09	0.15	0.04	0.03	0.08							
Queue Length 95th (ft)	7	0	3	3	6							
Control Delay (s)	3.2	0.0	15.0	17.5	15.8							
Lane LOS	A		B	C	C							
Approach Delay (s)	1.9		16.0		15.8							
Approach LOS			C		C							
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			68.8%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

19: P St & Inyo St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	283	559	38	101	25	0	0	18	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	308	608	41	110	27	0	0	20	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1000			1010							
pX, platoon unblocked												
vC, conflicting volume	649			0			933	1264	0	1257	1243	324
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	649			0			933	1264	0	1257	1243	324
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			81			35	80	100	100	86	99
cM capacity (veh/h)	933			1622			168	136	1084	93	140	671
Direction, Lane #	NW 1	NW 2	NE 1	NE 2	SW 1							
Volume Total	611	345	110	27	24							
Volume Left	308	0	110	0	0							
Volume Right	0	41	0	0	4							
cSH	1622	1700	168	136	164							
Volume to Capacity	0.19	0.20	0.65	0.20	0.15							
Queue Length 95th (ft)	17	0	93	18	12							
Control Delay (s)	4.8	0.0	59.7	37.9	30.7							
Lane LOS	A		F	E	D							
Approach Delay (s)	3.1		55.4		30.7							
Approach LOS			F		D							
Intersection Summary												
Average Delay			10.1									
Intersection Capacity Utilization			97.9%		ICU Level of Service				F			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

20: G St & Kern St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	29	98	9	24	145	63	2	63	23	13	29	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.8			4.8			4.8			4.8	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		0.99			0.96			0.96			0.99	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		3466			3379			1795			1821	
Flt Permitted		0.84			0.91			1.00			1.00	
Satd. Flow (perm)		2960			3086			1797			1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	107	10	26	158	68	2	68	25	14	32	3
RTOR Reduction (vph)	0	7	0	0	50	0	0	23	0	0	3	0
Lane Group Flow (vph)	0	142	0	0	202	0	0	72	0	0	46	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		3.9			3.9			1.4			1.4	
Effective Green, g (s)		3.9			3.9			1.4			1.4	
Actuated g/C Ratio		0.26			0.26			0.09			0.09	
Clearance Time (s)		4.8			4.8			4.8			4.8	
Vehicle Extension (s)		0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)		775			808			169			174	
v/s Ratio Prot												
v/s Ratio Perm		0.05			0.07			0.04			0.03	
v/c Ratio		0.18			0.25			0.43			0.27	
Uniform Delay, d1		4.3			4.3			6.4			6.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			0.1			0.6			0.3	
Delay (s)		4.3			4.4			7.0			6.6	
Level of Service		A			A			A			A	
Approach Delay (s)		4.3			4.4			7.0			6.6	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			5.0			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			14.9			Sum of lost time (s)			9.6			
Intersection Capacity Utilization			31.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

20: G St & Kern St










4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	19	267	104	110	413	13	153	204	116	30	294	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.8			4.8			4.8			4.8	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		0.96			1.00			0.97			0.98	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		3389			3491			1772			1824	
Flt Permitted		0.91			0.77			0.77			0.94	
Satd. Flow (perm)		3097			2725			1380			1723	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	290	113	120	449	14	166	222	126	33	320	50
RTOR Reduction (vph)	0	58	0	0	3	0	0	15	0	0	6	0
Lane Group Flow (vph)	0	366	0	0	580	0	0	499	0	0	397	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		15.2			15.2			24.4			24.4	
Effective Green, g (s)		15.2			15.2			24.4			24.4	
Actuated g/C Ratio		0.31			0.31			0.50			0.50	
Clearance Time (s)		4.8			4.8			4.8			4.8	
Vehicle Extension (s)		0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)		957			842			684			854	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.21			c0.36			0.23	
v/c Ratio		0.38			0.69			0.73			0.46	
Uniform Delay, d1		13.3			14.9			9.8			8.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			1.9			3.5			0.1	
Delay (s)		13.4			16.8			13.3			8.3	
Level of Service		B			B			B			A	
Approach Delay (s)		13.4			16.8			13.3			8.3	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			13.3		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			49.2		Sum of lost time (s)				9.6			
Intersection Capacity Utilization			88.5%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

21: H St & Kern St











4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	449	202	240	219	31	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	488	220	261	238	34	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	537			471		
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			708		1239	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			611		1165	243
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		74	93
cM capacity (veh/h)			925		129	727
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	
Volume Total	325	382	340	159	85	
Volume Left	0	0	261	0	34	
Volume Right	0	220	0	0	51	
cSH	1700	1700	925	1700	256	
Volume to Capacity	0.19	0.22	0.28	0.09	0.33	
Queue Length 95th (ft)	0	0	29	0	35	
Control Delay (s)	0.0	0.0	8.7	0.0	25.9	
Lane LOS			A		D	
Approach Delay (s)	0.0		5.9		25.9	
Approach LOS					D	
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			46.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

21: H St & Kern St



















4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	656	62	39	569	109	77
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	713	67	42	618	118	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	537			471		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			780		1141	390
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			583		976	159
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		46	89
cM capacity (veh/h)			907		218	789
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	
Volume Total	475	305	249	412	202	
Volume Left	0	0	42	0	118	
Volume Right	0	67	0	0	84	
cSH	1700	1700	907	1700	311	
Volume to Capacity	0.28	0.18	0.05	0.24	0.65	
Queue Length 95th (ft)	0	0	4	0	106	
Control Delay (s)	0.0	0.0	2.0	0.0	35.8	
Lane LOS			A		E	
Approach Delay (s)	0.0		0.7		35.8	
Approach LOS					E	
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization			57.7%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

22: E St & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	285	58	55	4	199	9	144	486	4	3	61	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	1.00		1.00	0.93	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1850		1770	1861		1770	1733	
Flt Permitted		0.63			0.99		0.68	1.00		0.31	1.00	
Satd. Flow (perm)		1154			1840		1263	1861		585	1733	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	310	63	60	4	216	10	157	528	4	3	66	57
RTOR Reduction (vph)	0	9	0	0	2	0	0	1	0	0	30	0
Lane Group Flow (vph)	0	424	0	0	228	0	157	531	0	3	93	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		25.9			25.9		31.2	31.2		31.2	31.2	
Effective Green, g (s)		25.9			25.9		31.2	31.2		31.2	31.2	
Actuated g/C Ratio		0.40			0.40		0.48	0.48		0.48	0.48	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		456			728		602	886		279	825	
v/s Ratio Prot								c0.29			0.05	
v/s Ratio Perm		c0.37			0.12		0.12			0.01		
v/c Ratio		0.93			0.31		0.26	0.60		0.01	0.11	
Uniform Delay, d1		18.9			13.7		10.3	12.6		9.0	9.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		25.0			0.1		0.1	0.7		0.0	0.0	
Delay (s)		43.9			13.7		10.3	13.3		9.0	9.5	
Level of Service		D			B		B	B		A	A	
Approach Delay (s)		43.9			13.7			12.6			9.5	
Approach LOS		D			B			B			A	
Intersection Summary												
HCM Average Control Delay			21.7			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			65.5			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			72.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: E St & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	277	74	253	71	341	79	51	412	14	25	1473	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1718			1809		1770	1854		1770	1834	
Flt Permitted		0.48			0.85		0.05	1.00		0.38	1.00	
Satd. Flow (perm)		837			1543		98	1854		705	1834	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	301	80	275	77	371	86	55	448	15	27	1601	187
RTOR Reduction (vph)	0	11	0	0	5	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	645	0	0	529	0	55	462	0	27	1785	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		55.8			55.8		75.8	75.8		75.8	75.8	
Effective Green, g (s)		55.8			55.8		75.8	75.8		75.8	75.8	
Actuated g/C Ratio		0.40			0.40		0.54	0.54		0.54	0.54	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		334			615		53	1004		382	993	
v/s Ratio Prot								0.25			c0.97	
v/s Ratio Perm		c0.77			0.34		0.56			0.04		
v/c Ratio		1.93			0.86		1.04	0.46		0.07	1.80	
Uniform Delay, d1		42.1			38.5		32.1	19.6		15.3	32.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		429.3			11.4		134.7	0.1		0.0	362.9	
Delay (s)		471.4			50.0		166.8	19.7		15.3	395.0	
Level of Service		F			D		F	B		B	F	
Approach Delay (s)		471.4			50.0			35.3			389.3	
Approach LOS		F			D			D			F	
Intersection Summary												
HCM Average Control Delay		301.1				HCM Level of Service				F		
HCM Volume to Capacity ratio		1.85										
Actuated Cycle Length (s)		140.0				Sum of lost time (s)				8.4		
Intersection Capacity Utilization		159.8%				ICU Level of Service				H		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: F st & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	14	86	2	3	28	101	4	689	85	64	84	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		1.00			0.90		1.00	0.98		1.00	0.97	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1846			1668		1770	1832		1770	1812	
Flt Permitted		0.95			1.00		0.69	1.00		0.20	1.00	
Satd. Flow (perm)		1773			1661		1277	1832		369	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	93	2	3	30	110	4	749	92	70	91	20
RTOR Reduction (vph)	0	2	0	0	84	0	0	6	0	0	8	0
Lane Group Flow (vph)	0	108	0	0	59	0	4	835	0	70	103	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		13.3			13.3		34.2	34.2		34.2	34.2	
Effective Green, g (s)		13.3			13.3		34.2	34.2		34.2	34.2	
Actuated g/C Ratio		0.24			0.24		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		422			395		781	1121		226	1109	
v/s Ratio Prot								c0.46			0.06	
v/s Ratio Perm		c0.06			0.04		0.00			0.19		
v/c Ratio		0.26			0.15		0.01	0.74		0.31	0.09	
Uniform Delay, d1		17.3			16.8		4.2	7.7		5.2	4.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.1		0.0	2.4		0.3	0.0	
Delay (s)		17.4			16.9		4.2	10.1		5.5	4.5	
Level of Service		B			B		A	B		A	A	
Approach Delay (s)		17.4			16.9			10.1			4.9	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			10.7			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			55.9			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			75.2%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: F st & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	28	121	66	22	211	58	49	600	103	111	1555	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.97		1.00	0.98		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774			1806		1770	1822		1770	1821	
Flt Permitted		0.67			0.89		0.04	1.00		0.31	1.00	
Satd. Flow (perm)		1201			1616		69	1822		573	1821	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	132	72	24	229	63	53	652	112	121	1690	299
RTOR Reduction (vph)	0	12	0	0	7	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	222	0	0	309	0	53	760	0	121	1984	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		23.8			23.8		107.8	107.8		107.8	107.8	
Effective Green, g (s)		23.8			23.8		107.8	107.8		107.8	107.8	
Actuated g/C Ratio		0.17			0.17		0.77	0.77		0.77	0.77	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		204			275		53	1403		441	1402	
v/s Ratio Prot								0.42			c1.09	
v/s Ratio Perm		0.19			c0.19		0.77			0.21		
v/c Ratio		1.09			1.12		1.00	0.54		0.27	1.42	
Uniform Delay, d1		58.1			58.1		16.1	6.4		4.7	16.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		89.1			92.2		123.6	0.2		0.1	191.2	
Delay (s)		147.2			150.3		139.7	6.6		4.8	207.3	
Level of Service		F			F		F	A		A	F	
Approach Delay (s)		147.2			150.3			15.2			195.7	
Approach LOS		F			F			B			F	
Intersection Summary												
HCM Average Control Delay		145.9				HCM Level of Service				F		
HCM Volume to Capacity ratio		1.36										
Actuated Cycle Length (s)		140.0				Sum of lost time (s)			8.4			
Intersection Capacity Utilization		124.2%				ICU Level of Service			H			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: G St & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	98	100	8	6	114	36	64	807	17	22	170	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	1.00		1.00	0.94	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3436			3410		1770	1857		1770	1757	
Flt Permitted		0.76			0.94		0.53	1.00		0.10	1.00	
Satd. Flow (perm)		2668			3229		981	1857		194	1757	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	109	9	7	124	39	70	877	18	24	185	113
RTOR Reduction (vph)	0	4	0	0	24	0	0	1	0	0	28	0
Lane Group Flow (vph)	0	221	0	0	146	0	70	894	0	24	271	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		30.0			30.0		38.4	38.4		38.4	38.4	
Effective Green, g (s)		30.0			30.0		38.4	38.4		38.4	38.4	
Actuated g/C Ratio		0.39			0.39		0.50	0.50		0.50	0.50	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1042			1261		491	929		97	879	
v/s Ratio Prot								c0.48			0.15	
v/s Ratio Perm		c0.08			0.05		0.07			0.12		
v/c Ratio		0.21			0.12		0.14	0.96		0.25	0.31	
Uniform Delay, d1		15.5			14.9		10.3	18.5		11.0	11.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.0	20.7		0.5	0.1	
Delay (s)		15.6			15.0		10.4	39.2		11.4	11.4	
Level of Service		B			B		B	D		B	B	
Approach Delay (s)		15.6			15.0			37.1			11.4	
Approach LOS		B			B			D			B	
Intersection Summary												
HCM Average Control Delay			27.1			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			76.8			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			113.7%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: G St & Tulare St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	268	325	162	80	438	44	76	661	44	43	1724	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.97			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3366			3473		1770	1845		1770	1827	
Flt Permitted		0.55			0.55		0.05	1.00		0.22	1.00	
Satd. Flow (perm)		1883			1922		86	1845		415	1827	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	291	353	176	87	476	48	83	718	48	47	1874	275
RTOR Reduction (vph)	0	12	0	0	5	0	0	2	0	0	4	0
Lane Group Flow (vph)	0	808	0	0	606	0	83	764	0	47	2145	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		44.8			44.8		86.8	86.8		86.8	86.8	
Effective Green, g (s)		44.8			44.8		86.8	86.8		86.8	86.8	
Actuated g/C Ratio		0.32			0.32		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.2			4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)		0.2			0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		603			615		53	1144		257	1133	
v/s Ratio Prot								0.41			c1.17	
v/s Ratio Perm		c0.43			0.32		0.97			0.11		
v/c Ratio		1.70dl			0.99		1.57	0.67		0.18	1.89	
Uniform Delay, d1		47.6			47.3		26.6	17.3		11.4	26.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		163.8			32.3		327.7	1.2		0.1	405.4	
Delay (s)		211.4			79.6		354.3	18.4		11.5	432.0	
Level of Service		F			E		F	B		B	F	
Approach Delay (s)		211.4			79.6			51.2			423.0	
Approach LOS		F			E			D			F	

Intersection Summary

HCM Average Control Delay	266.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	166.6%	ICU Level of Service	H
Analysis Period (min)	15		





















dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

25: H St & Tulare St





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	243	445	43	105	258	80	121	663	153	61	193	75
ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3492		1770	3413		1770	3440		1770	3390	
Flt Permitted	0.53	1.00		0.42	1.00		0.57	1.00		0.23	1.00	
Satd. Flow (perm)	993	3492		786	3413		1068	3440		427	3390	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	264	484	47	114	280	87	132	721	166	66	210	82
RTOR Reduction (vph)	0	13	0	0	51	0	0	32	0	0	46	0
Lane Group Flow (vph)	264	518	0	114	316	0	132	855	0	66	246	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	23.6	23.6		23.6	23.6		25.0	25.0		25.0	25.0	
Effective Green, g (s)	23.6	23.6		23.6	23.6		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.44	0.44		0.44	0.44	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	409	1438		324	1406		466	1501		186	1479	
v/s Ratio Prot		0.15			0.09			c0.25			0.07	
v/s Ratio Perm	c0.27			0.14			0.12			0.15		
v/c Ratio	0.65	0.36		0.35	0.22		0.28	0.57		0.35	0.17	
Uniform Delay, d1	13.5	11.6		11.6	10.9		10.4	12.1		10.8	9.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.1		0.2	0.0		0.1	0.3		0.4	0.0	
Delay (s)	16.1	11.7		11.8	11.0		10.5	12.4		11.2	9.8	
Level of Service	B	B		B	B		B	B		B	A	
Approach Delay (s)		13.2			11.2			12.2			10.1	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			12.0			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			57.3			Sum of lost time (s)				8.7		
Intersection Capacity Utilization			96.9%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: H St & Tulare St





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	189	422	197	187	321	145	88	781	131	175	1656	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.95		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3370		1770	3374		1770	3463		1770	3476	
Flt Permitted	0.36	1.00		0.26	1.00		0.06	1.00		0.22	1.00	
Satd. Flow (perm)	679	3370		477	3374		117	3463		415	3476	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	205	459	214	203	349	158	96	849	142	190	1800	243
RTOR Reduction (vph)	0	11	0	0	47	0	0	12	0	0	10	0
Lane Group Flow (vph)	205	662	0	203	460	0	96	979	0	190	2033	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	37.5	37.5		37.5	37.5		63.8	63.8		63.8	63.8	
Effective Green, g (s)	37.5	37.5		37.5	37.5		63.8	63.8		63.8	63.8	
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.58	0.58		0.58	0.58	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	231	1149		163	1150		68	2009		241	2016	
v/s Ratio Prot		0.20			0.14			0.28			0.58	
v/s Ratio Perm	0.30			0.43			0.82			0.46		
v/c Ratio	0.89	0.58		1.25	0.40		1.41	0.49		0.79	1.01	
Uniform Delay, d1	34.3	29.7		36.2	27.7		23.1	13.5		17.9	23.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.2	0.4		151.3	0.1		252.0	0.1		14.5	22.2	
Delay (s)	64.4	30.2		187.6	27.7		275.1	13.6		32.4	45.3	
Level of Service	E	C		F	C		F	B		C	D	
Approach Delay (s)		38.2			73.4			36.7			44.2	
Approach LOS		D			E			D			D	
Intersection Summary												
HCM Average Control Delay			45.7			HCM Level of Service					D	
HCM Volume to Capacity ratio			1.35									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				8.7		
Intersection Capacity Utilization			126.6%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: Van Ness Ave & Tulare St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	85	210	85	136	377	55	118	510	160	60	228	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.96		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1782		1770	3471		1770	3412		1770	3323	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1782		1770	3471		1770	3412		1770	3323	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	228	92	148	410	60	128	554	174	65	248	170
RTOR Reduction (vph)	0	19	0	0	15	0	0	39	0	0	122	0
Lane Group Flow (vph)	92	301	0	148	455	0	128	689	0	65	296	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.0	17.8		8.4	20.2		5.9	21.0		4.0	19.1	
Effective Green, g (s)	6.0	17.8		8.4	20.2		5.9	21.0		4.0	19.1	
Actuated g/C Ratio	0.09	0.26		0.12	0.30		0.09	0.31		0.06	0.28	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	157	469		220	1037		154	1060		105	939	
v/s Ratio Prot	0.05	c0.17		c0.08	0.13		c0.07	c0.20		0.04	0.09	
v/s Ratio Perm												
v/c Ratio	0.59	0.64		0.67	0.44		0.83	0.65		0.62	0.32	
Uniform Delay, d1	29.6	22.1		28.3	19.1		30.4	20.1		31.1	19.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	4.1		6.2	0.6		28.9	1.9		7.4	0.4	
Delay (s)	33.2	26.1		34.5	19.8		59.3	22.0		38.5	19.5	
Level of Service	C	C		C	B		E	C		D	B	
Approach Delay (s)		27.7			23.3			27.6			22.1	
Approach LOS		C			C			C			C	





















Intersection Summary

HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	12.2
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

26: Van Ness Ave & Tulare St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	399	207	348	430	84	140	835	156	126	1335	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1767		1770	3453		1770	3455		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1767		1770	3453		1770	3455		1770	3467	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	434	225	378	467	91	152	908	170	137	1451	229
RTOR Reduction (vph)	0	13	0	0	10	0	0	10	0	0	8	0
Lane Group Flow (vph)	120	646	0	378	548	0	152	1068	0	137	1672	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	14.0	45.8		23.0	54.8		10.0	52.8		12.0	54.8	
Effective Green, g (s)	14.0	45.8		23.0	54.8		10.0	52.8		12.0	54.8	
Actuated g/C Ratio	0.09	0.31		0.15	0.37		0.07	0.35		0.08	0.37	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.2		4.0	4.2	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	165	540		271	1261		118	1216		142	1267	
v/s Ratio Prot	0.07	c0.37		c0.21	0.16		c0.09	0.31		0.08	c0.48	
v/s Ratio Perm												
v/c Ratio	0.73	1.20		1.39	0.43		1.29	0.88		0.96	1.32	
Uniform Delay, d1	66.1	52.1		63.5	35.9		70.0	45.6		68.8	47.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.7	105.7		198.7	0.5		179.0	8.0		64.0	149.4	
Delay (s)	78.8	157.8		262.2	36.4		249.0	53.6		132.8	197.0	
Level of Service	E	F		F	D		F	D		F	F	
Approach Delay (s)		145.7			127.6			77.8			192.2	
Approach LOS		F			F			E			F	
Intersection Summary												
HCM Average Control Delay		142.3			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.25										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			12.2				
Intersection Capacity Utilization		117.9%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: M St & Tulare St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	167	374	180	0	0	0	0	492	154	176	552	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5	4.5					4.5		4.5	4.5	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5008	1583					3413		1770	3539	
Flt Permitted		0.98	1.00					1.00		0.35	1.00	
Satd. Flow (perm)		5008	1583					3413		644	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	407	196	0	0	0	0	535	167	191	600	0
RTOR Reduction (vph)	0	0	128	0	0	0	0	53	0	0	0	0
Lane Group Flow (vph)	0	589	68	0	0	0	0	649	0	191	600	0
Turn Type	Split		Perm							Perm		
Protected Phases	2	2						4			4	
Permitted Phases			2							4		
Actuated Green, G (s)		19.0	19.0					27.1		27.1	27.1	
Effective Green, g (s)		19.0	19.0					27.1		27.1	27.1	
Actuated g/C Ratio		0.34	0.34					0.49		0.49	0.49	
Clearance Time (s)		4.5	4.5					4.5		4.5	4.5	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1727	546					1679		317	1741	
v/s Ratio Prot		c0.12						0.19			0.17	
v/s Ratio Perm			0.04							c0.30		
v/c Ratio		0.34	0.12					0.39		0.60	0.34	
Uniform Delay, d1		13.4	12.4					8.8		10.1	8.6	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0					0.1		2.2	0.0	
Delay (s)		13.4	12.4					8.8		12.3	8.6	
Level of Service		B	B					A		B	A	
Approach Delay (s)		13.2			0.0			8.8			9.5	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM Average Control Delay			10.6									
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			55.1							9.0		
Intersection Capacity Utilization			70.4%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: M St & Tulare St




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	213	1195	408	0	0	0	0	820	217	238	1231	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5	4.5					4.5		4.5	4.5	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5047	1583					3428		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.18	1.00	
Satd. Flow (perm)		5047	1583					3428		329	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	232	1299	443	0	0	0	0	891	236	259	1338	0
RTOR Reduction (vph)	0	0	24	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	1531	419	0	0	0	0	1125	0	259	1338	0
Turn Type	Split		Perm							Perm		
Protected Phases	2	2						4			4	
Permitted Phases			2							4		
Actuated Green, G (s)		19.4	19.4					31.5		31.5	31.5	
Effective Green, g (s)		19.4	19.4					31.5		31.5	31.5	
Actuated g/C Ratio		0.32	0.32					0.53		0.53	0.53	
Clearance Time (s)		4.5	4.5					4.5		4.5	4.5	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1635	513					1803		173	1861	
v/s Ratio Prot		c0.30						0.33			0.38	
v/s Ratio Perm			0.26							c0.79		
v/c Ratio		0.94	0.82					0.62		1.50	0.72	
Uniform Delay, d1		19.7	18.6					10.0		14.2	10.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		10.4	9.3					0.5		251.6	1.1	
Delay (s)		30.0	27.9					10.5		265.8	12.0	
Level of Service		C	C					B		F	B	
Approach Delay (s)		29.6			0.0			10.5			53.1	
Approach LOS		C			A			B			D	
Intersection Summary												
HCM Average Control Delay			33.0								C	
HCM Volume to Capacity ratio			1.28									
Actuated Cycle Length (s)			59.9							9.0		
Intersection Capacity Utilization			89.9%							E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: P St & Tulare St




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	114	306	43	128	330	0	0	962	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Lane Util. Factor				1.00	1.00	1.00	1.00	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	1863	1583	1770	3539			3539	1583
Flt Permitted				0.95	1.00	1.00	0.21	1.00			1.00	1.00
Satd. Flow (perm)				1770	1863	1583	396	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	124	333	47	139	359	0	0	1046	112
RTOR Reduction (vph)	0	0	0	0	0	22	0	0	0	0	0	48
Lane Group Flow (vph)	0	0	0	124	333	25	139	359	0	0	1046	64
Turn Type				Split		Perm	Perm					Perm
Protected Phases				6	6			8			4	
Permitted Phases						6	8					4
Actuated Green, G (s)				15.6	15.6	15.6	28.4	28.4			28.4	28.4
Effective Green, g (s)				15.6	15.6	15.6	28.4	28.4			28.4	28.4
Actuated g/C Ratio				0.30	0.30	0.30	0.54	0.54			0.54	0.54
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Vehicle Extension (s)				3.0	3.0	3.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)				527	555	471	215	1918			1918	858
v/s Ratio Prot				0.07	c0.18			0.10			0.30	
v/s Ratio Perm						0.02	c0.35					0.04
v/c Ratio				0.24	0.60	0.05	0.65	0.19			0.55	0.07
Uniform Delay, d1				13.9	15.7	13.1	8.5	6.1			7.8	5.7
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.2	1.8	0.0	8.8	0.1			0.6	0.1
Delay (s)				14.1	17.5	13.2	17.3	6.2			8.4	5.8
Level of Service				B	B	B	B	A			A	A
Approach Delay (s)		0.0			16.3			9.3			8.1	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.3		HCM Level of Service						B	
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			52.4		Sum of lost time (s)						8.4	
Intersection Capacity Utilization			70.4%		ICU Level of Service						C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: P St & Tulare St























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	82	568	95	163	1248	0	0	1196	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Lane Util. Factor				1.00	1.00	1.00	1.00	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	1863	1583	1770	3539			3539	1583
Flt Permitted				0.95	1.00	1.00	0.14	1.00			1.00	1.00
Satd. Flow (perm)				1770	1863	1583	259	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	89	617	103	177	1357	0	0	1300	200
RTOR Reduction (vph)	0	0	0	0	0	19	0	0	0	0	0	32
Lane Group Flow (vph)	0	0	0	89	617	84	177	1357	0	0	1300	168
Turn Type				Split		Perm	Perm					Perm
Protected Phases				6	6			8			4	
Permitted Phases						6	8					4
Actuated Green, G (s)				24.8	24.8	24.8	46.8	46.8			46.8	46.8
Effective Green, g (s)				24.8	24.8	24.8	46.8	46.8			46.8	46.8
Actuated g/C Ratio				0.31	0.31	0.31	0.58	0.58			0.58	0.58
Clearance Time (s)				4.2	4.2	4.2	4.2	4.2			4.2	4.2
Vehicle Extension (s)				3.0	3.0	3.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)				549	578	491	152	2070			2070	926
v/s Ratio Prot				0.05	c0.33			0.38			0.37	
v/s Ratio Perm						0.05	c0.68					0.11
v/c Ratio				0.16	1.07	0.17	1.16	0.66			0.63	0.18
Uniform Delay, d1				20.1	27.6	20.1	16.6	11.2			10.9	7.7
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.1	56.7	0.2	124.0	1.0			0.9	0.2
Delay (s)				20.2	84.3	20.3	140.6	12.2			11.7	7.9
Level of Service				C	F	C	F	B			B	A
Approach Delay (s)		0.0			69.1			27.0			11.2	
Approach LOS		A			E			C			B	
Intersection Summary												
HCM Average Control Delay			29.7									
HCM Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			89.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: R Street & Tulare St























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	37	156	44	118	210	81	47	276	26	90	984	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3494		1770	3487	
Flt Permitted	0.58	1.00	1.00	0.65	1.00	1.00	0.15	1.00		0.55	1.00	
Satd. Flow (perm)	1086	1863	1583	1210	1863	1583	287	3494		1031	3487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	170	48	128	228	88	51	300	28	98	1070	116
RTOR Reduction (vph)	0	0	32	0	0	59	0	12	0	0	14	0
Lane Group Flow (vph)	40	170	16	128	228	29	51	316	0	98	1172	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	19.0	19.0	19.0	19.0	19.0	19.0	30.0	30.0		30.0	30.0	
Effective Green, g (s)	19.0	19.0	19.0	19.0	19.0	19.0	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	357	612	520	398	612	520	149	1813		535	1810	
v/s Ratio Prot		0.09			c0.12			0.09			c0.34	
v/s Ratio Perm	0.04		0.01	0.11		0.02	0.18			0.10		
v/c Ratio	0.11	0.28	0.03	0.32	0.37	0.06	0.34	0.17		0.18	0.65	
Uniform Delay, d1	13.5	14.3	13.2	14.6	14.8	13.3	8.1	7.4		7.4	10.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.2	0.1	0.0	0.5	0.0		0.1	0.6	
Delay (s)	13.6	14.4	13.2	14.7	15.0	13.3	8.6	7.4		7.4	10.7	
Level of Service	B	B	B	B	B	B	A	A		A	B	
Approach Delay (s)		14.1			14.6			7.5			10.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM Average Control Delay			11.1			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			57.8			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			101.9%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: R Street & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	113	421	166	243	370	103	125	936	247	65	965	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3428		1770	3514	
Flt Permitted	0.39	1.00	1.00	0.33	1.00	1.00	0.15	1.00		0.13	1.00	
Satd. Flow (perm)	734	1863	1583	623	1863	1583	282	3428		248	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	458	180	264	402	112	136	1017	268	71	1049	53
RTOR Reduction (vph)	0	0	31	0	0	34	0	37	0	0	5	0
Lane Group Flow (vph)	123	458	149	264	402	78	136	1248	0	71	1097	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	26.2	26.2	26.2	26.2	26.2	26.2	30.0	30.0		30.0	30.0	
Effective Green, g (s)	26.2	26.2	26.2	26.2	26.2	26.2	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.46	0.46		0.46	0.46	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.2	4.2		4.2	4.2	
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)	296	751	638	251	751	638	130	1582		114	1622	
v/s Ratio Prot		0.25			0.22			0.36			0.31	
v/s Ratio Perm	0.17		0.09	c0.42		0.05	c0.48			0.29		
v/c Ratio	0.42	0.61	0.23	1.05	0.54	0.12	1.05	0.79		0.62	0.68	
Uniform Delay, d1	13.9	15.4	12.8	19.4	14.8	12.2	17.5	14.8		13.2	13.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0	0.1	71.1	0.4	0.0	91.8	2.5		7.4	0.9	
Delay (s)	14.3	16.3	12.9	90.5	15.1	12.2	109.3	17.3		20.6	14.6	
Level of Service	B	B	B	F	B	B	F	B		C	B	
Approach Delay (s)		15.2			40.3			26.1			15.0	
Approach LOS		B			D			C			B	
Intersection Summary												
HCM Average Control Delay			23.6			HCM Level of Service				C		
HCM Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)				8.8		
Intersection Capacity Utilization			111.4%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: U Street & Tulare St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	39	205	38	0	0	0	21	285	74	307	1147	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	0.97		1.00	0.98	
Flt Protected		0.99	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1848	1583				1770	3430		1770	3474	
Flt Permitted		0.99	1.00				0.13	1.00		0.52	1.00	
Satd. Flow (perm)		1848	1583				244	3430		971	3474	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	223	41	0	0	0	23	310	80	334	1247	174
RTOR Reduction (vph)	0	0	21	0	0	0	0	23	0	0	11	0
Lane Group Flow (vph)	0	265	20	0	0	0	23	367	0	334	1410	0
Turn Type	Split		Perm				Perm			Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		10.5	10.5				31.2	31.2		31.2	31.2	
Effective Green, g (s)		10.5	10.5				31.2	31.2		31.2	31.2	
Actuated g/C Ratio		0.21	0.21				0.61	0.61		0.61	0.61	
Clearance Time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2				4.1	4.1		4.1	4.1	
Lane Grp Cap (vph)		381	327				150	2102		595	2129	
v/s Ratio Prot		c0.14						0.11			c0.41	
v/s Ratio Perm			0.01				0.09			0.34		
v/c Ratio		0.70	0.06				0.15	0.17		0.56	0.66	
Uniform Delay, d1		18.7	16.2				4.2	4.3		5.8	6.4	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.4	0.0				0.7	0.1		1.5	0.9	
Delay (s)		23.1	16.3				4.9	4.3		7.3	7.3	
Level of Service		C	B				A	A		A	A	
Approach Delay (s)		22.2			0.0			4.4			7.3	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM Average Control Delay			8.7								A	
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			50.9							9.2		
Intersection Capacity Utilization			69.6%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: U Street & Tulare St










4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	254	486	59	0	0	0	30	915	85	304	969	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	0.99		1.00	0.98	
Flt Protected		0.98	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831	1583				1770	3494		1770	3455	
Flt Permitted		0.98	1.00				0.14	1.00		0.19	1.00	
Satd. Flow (perm)		1831	1583				264	3494		353	3455	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	528	64	0	0	0	33	995	92	330	1053	198
RTOR Reduction (vph)	0	0	9	0	0	0	0	7	0	0	16	0
Lane Group Flow (vph)	0	804	55	0	0	0	33	1080	0	330	1235	0
Turn Type	Split		Perm				Perm			Perm		
Protected Phases	4	4						2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)		34.4	34.4				56.4	56.4		56.4	56.4	
Effective Green, g (s)		34.4	34.4				56.4	56.4		56.4	56.4	
Actuated g/C Ratio		0.34	0.34				0.56	0.56		0.56	0.56	
Clearance Time (s)		4.6	4.6				4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2				4.1	4.1		4.1	4.1	
Lane Grp Cap (vph)		630	545				149	1971		199	1949	
v/s Ratio Prot		c0.44						0.31			0.36	
v/s Ratio Perm			0.04				0.12			c0.93		
v/c Ratio		1.28	0.10				0.22	0.55		1.66	0.63	
Uniform Delay, d1		32.8	22.3				10.9	13.8		21.8	14.8	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		136.3	0.0				1.1	0.4		317.5	0.8	
Delay (s)		169.1	22.3				11.9	14.2		339.3	15.6	
Level of Service		F	C				B	B		F	B	
Approach Delay (s)		158.3			0.0			14.1			83.1	
Approach LOS		F			A			B			F	
Intersection Summary												
HCM Average Control Delay			79.8									HCM Level of Service E
HCM Volume to Capacity ratio			1.51									
Actuated Cycle Length (s)			100.0							9.2		
Intersection Capacity Utilization			96.0%							F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: Divisadero Connector & Tulare St










4/25/2011

						
Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	0	839	0	315	617	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.1		4.1	4.6	
Lane Util. Factor		0.88		0.95	0.95	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		2787		3539	3539	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		2787		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	912	0	342	671	0
RTOR Reduction (vph)	0	503	0	0	0	0
Lane Group Flow (vph)	0	409	0	342	671	0
Turn Type	custom					
Protected Phases				6	4	
Permitted Phases		7				
Actuated Green, G (s)		15.3		10.6	14.8	
Effective Green, g (s)		15.3		10.6	14.8	
Actuated g/C Ratio		0.45		0.31	0.43	
Clearance Time (s)		4.1		4.1	4.6	
Vehicle Extension (s)		1.2		3.0	4.0	
Lane Grp Cap (vph)		1250		1100	1536	
v/s Ratio Prot				c0.10	c0.19	
v/s Ratio Perm		0.15				
v/c Ratio		0.33		0.31	0.44	
Uniform Delay, d1		6.1		9.0	6.7	
Progression Factor		1.00		1.00	1.00	
Incremental Delay, d2		0.1		0.2	0.3	
Delay (s)		6.1		9.1	7.0	
Level of Service		A		A	A	
Approach Delay (s)	6.1			9.1	7.0	
Approach LOS	A			A	A	
Intersection Summary						
HCM Average Control Delay			7.0	HCM Level of Service		A
HCM Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			34.1	Sum of lost time (s)		8.7
Intersection Capacity Utilization			53.7%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

31: Divisadero Connector & Tulare St


















4/25/2011

						
Movement	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	0	1096	0	1194	465	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.1		4.1	4.6	
Lane Util. Factor		0.88		0.95	0.95	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		2787		3539	3539	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		2787		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1191	0	1298	505	0
RTOR Reduction (vph)	0	817	0	0	0	0
Lane Group Flow (vph)	0	374	0	1298	505	0
Turn Type	custom					
Protected Phases				6	4	
Permitted Phases		7				
Actuated Green, G (s)		14.1		22.6	13.6	
Effective Green, g (s)		14.1		22.6	13.6	
Actuated g/C Ratio		0.31		0.50	0.30	
Clearance Time (s)		4.1		4.1	4.6	
Vehicle Extension (s)		1.2		3.0	4.0	
Lane Grp Cap (vph)		875		1781	1072	
v/s Ratio Prot				c0.37	c0.14	
v/s Ratio Perm		0.13				
v/c Ratio		0.43		0.73	0.47	
Uniform Delay, d1		12.2		8.7	12.7	
Progression Factor		1.00		1.00	1.00	
Incremental Delay, d2		0.1		1.5	0.4	
Delay (s)		12.3		10.3	13.2	
Level of Service		B		B	B	
Approach Delay (s)	12.3			10.3	13.2	
Approach LOS	B			B	B	
Intersection Summary						
HCM Average Control Delay			11.6	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			44.9	Sum of lost time (s)		8.7
Intersection Capacity Utilization			58.4%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

32: E Divisadero St & 41 SB Off-Ramp


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	592	9	0	524	0	0	0	0	434	856	819
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.91	0.91	1.00
Frt		1.00			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3531			3539					1610	3382	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3531			3539					1610	3382	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	643	10	0	570	0	0	0	0	472	930	890
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	652	0	0	570	0	0	0	0	425	977	865
Turn Type										Perm		Perm
Protected Phases		4			8						2	
Permitted Phases										2		2
Actuated Green, G (s)		14.8			14.8					35.7	35.7	35.7
Effective Green, g (s)		14.8			14.8					35.7	35.7	35.7
Actuated g/C Ratio		0.25			0.25					0.61	0.61	0.61
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		893			895					983	2064	966
v/s Ratio Prot		c0.18			0.16							
v/s Ratio Perm										0.26	0.29	c0.55
v/c Ratio		0.73			0.64					0.43	0.47	0.90
Uniform Delay, d1		20.0			19.5					6.0	6.2	9.8
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		3.0			1.5					0.3	0.2	10.7
Delay (s)		23.0			21.0					6.3	6.4	20.6
Level of Service		C			C					A	A	C
Approach Delay (s)		23.0			21.0			0.0			11.9	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM Average Control Delay			15.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			58.5			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			71.9%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: E Divisadero St & 41 SB Off-Ramp

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1132	70	0	732	0	0	0	0	543	1057	670
ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.91	0.91	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3508			3539					1610	3382	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3508			3539					1610	3382	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1230	76	0	796	0	0	0	0	590	1149	728
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	35
Lane Group Flow (vph)	0	1299	0	0	796	0	0	0	0	531	1208	693
Turn Type										Perm		Perm
Protected Phases		4			8						2	
Permitted Phases										2		2
Actuated Green, G (s)		25.0			25.0					32.0	32.0	32.0
Effective Green, g (s)		25.0			25.0					32.0	32.0	32.0
Actuated g/C Ratio		0.38			0.38					0.49	0.49	0.49
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1349			1361					793	1665	779
v/s Ratio Prot		c0.37			0.22							
v/s Ratio Perm										0.33	0.36	c0.44
v/c Ratio		0.96			0.58					0.67	0.73	0.89
Uniform Delay, d1		19.5			15.9					12.5	13.0	14.9
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		16.4			0.6					2.2	1.6	12.1
Delay (s)		36.0			16.5					14.7	14.6	27.0
Level of Service		D			B					B	B	C
Approach Delay (s)		36.0			16.5			0.0			18.3	
Approach LOS		D			B			A			B	
Intersection Summary												
HCM Average Control Delay			23.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			70.2%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Tulare St & 41 Off- Ramp

4/25/2011

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Volume (vph)	131	229	0	407	212	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1583		3539	1770	1583
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3539	1583		3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	249	0	442	230	514
RTOR Reduction (vph)	0	161	0	0	0	254
Lane Group Flow (vph)	142	88	0	442	230	260
Turn Type		Perm				Perm
Protected Phases	6			6	8	
Permitted Phases		6				8
Actuated Green, G (s)	20.8	20.8		20.8	29.6	29.6
Effective Green, g (s)	20.8	20.8		20.8	29.6	29.6
Actuated g/C Ratio	0.35	0.35		0.35	0.51	0.51
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1
Vehicle Extension (s)	3.0	3.0		3.0	0.2	0.2
Lane Grp Cap (vph)	1256	562		1256	894	800
v/s Ratio Prot	0.04			c0.12	0.13	
v/s Ratio Perm		0.06				c0.16
v/c Ratio	0.11	0.16		0.35	0.26	0.32
Uniform Delay, d1	12.7	12.9		13.9	8.2	8.6
Progression Factor	1.00	1.00		0.62	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.1	0.1	0.1
Delay (s)	12.7	13.0		8.7	8.3	8.7
Level of Service	B	B		A	A	A
Approach Delay (s)	12.9			8.7	8.6	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay			9.7		HCM Level of Service	A
HCM Volume to Capacity ratio			0.34			
Actuated Cycle Length (s)			58.6		Sum of lost time (s)	8.2
Intersection Capacity Utilization			44.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

33: Tulare St & 41 Off- Ramp











4/25/2011

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Volume (vph)	605	685	0	339	197	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1
Lane Util. Factor	0.95	1.00		0.95	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	3539	1583		3539	1770	1583
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	3539	1583		3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	658	745	0	368	214	593
RTOR Reduction (vph)	0	495	0	0	0	35
Lane Group Flow (vph)	658	250	0	368	214	558
Turn Type		Perm				Perm
Protected Phases	6			6	8	
Permitted Phases		6				8
Actuated Green, G (s)	26.8	26.8		26.8	45.0	45.0
Effective Green, g (s)	26.8	26.8		26.8	45.0	45.0
Actuated g/C Ratio	0.34	0.34		0.34	0.56	0.56
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1
Vehicle Extension (s)	3.0	3.0		3.0	0.2	0.2
Lane Grp Cap (vph)	1186	530		1186	996	890
v/s Ratio Prot	c0.19			0.10	0.12	
v/s Ratio Perm		0.16				c0.35
v/c Ratio	0.55	0.47		0.31	0.21	0.63
Uniform Delay, d1	21.7	21.0		19.7	8.7	11.8
Progression Factor	1.00	1.00		0.63	1.00	1.00
Incremental Delay, d2	0.6	0.7		0.1	0.0	1.0
Delay (s)	22.3	21.7		12.6	8.7	12.8
Level of Service	C	C		B	A	B
Approach Delay (s)	22.0			12.6	11.7	
Approach LOS	C			B	B	
Intersection Summary						
HCM Average Control Delay			17.4		HCM Level of Service	B
HCM Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	8.2
Intersection Capacity Utilization			57.4%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

330: E Divisadero St &











4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	386	531	495	531	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.1	4.1	4.1		
Lane Util. Factor	0.97	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	3776	3893	3893	1742		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	3776	3893	3893	1742		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	420	577	538	577	0	0
RTOR Reduction (vph)	0	0	0	404	0	0
Lane Group Flow (vph)	420	577	538	173	0	0
Turn Type	Prot			Perm		
Protected Phases	3	8	4			
Permitted Phases				4		
Actuated Green, G (s)	8.3	29.6	17.6	17.6		
Effective Green, g (s)	8.3	29.6	17.6	17.6		
Actuated g/C Ratio	0.14	0.51	0.30	0.30		
Clearance Time (s)	3.7	4.1	4.1	4.1		
Vehicle Extension (s)	8.0	0.2	4.1	4.1		
Lane Grp Cap (vph)	535	1966	1169	523		
v/s Ratio Prot	c0.11	0.15	c0.14			
v/s Ratio Perm				0.10		
v/c Ratio	0.79	0.29	0.46	0.33		
Uniform Delay, d1	24.3	8.4	16.6	15.9		
Progression Factor	1.00	1.00	1.15	2.37		
Incremental Delay, d2	10.3	0.0	0.4	0.5		
Delay (s)	34.6	8.5	19.5	38.2		
Level of Service	C	A	B	D		
Approach Delay (s)		19.5	29.2		0.0	
Approach LOS		B	C		A	
Intersection Summary						
HCM Average Control Delay			24.6		HCM Level of Service	C
HCM Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			58.6		Sum of lost time (s)	32.7
Intersection Capacity Utilization			71.9%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

330: E Divisadero St &
























4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	962	751	702	520	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.1	4.1	4.1		
Lane Util. Factor	0.97	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	3776	3893	3893	1742		
Flt Permitted	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	3776	3893	3893	1742		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1046	816	763	565	0	0
RTOR Reduction (vph)	0	0	0	431	0	0
Lane Group Flow (vph)	1046	816	763	134	0	0
Turn Type	Prot			Perm		
Protected Phases	3	8	4			
Permitted Phases				4		
Actuated Green, G (s)	22.3	45.0	19.0	19.0		
Effective Green, g (s)	22.3	45.0	19.0	19.0		
Actuated g/C Ratio	0.28	0.56	0.24	0.24		
Clearance Time (s)	3.7	4.1	4.1	4.1		
Vehicle Extension (s)	8.0	0.2	4.1	4.1		
Lane Grp Cap (vph)	1053	2190	925	414		
v/s Ratio Prot	c0.28	0.21	c0.20			
v/s Ratio Perm				0.08		
v/c Ratio	0.99	0.37	0.82	0.32		
Uniform Delay, d1	28.8	9.7	28.9	25.2		
Progression Factor	1.00	1.00	1.14	2.46		
Incremental Delay, d2	26.2	0.0	5.5	0.6		
Delay (s)	55.0	9.7	38.6	62.4		
Level of Service	D	A	D	E		
Approach Delay (s)		35.1	48.7		0.0	
Approach LOS		D	D		A	
Intersection Summary						
HCM Average Control Delay			40.8		HCM Level of Service	D
HCM Volume to Capacity ratio			0.92			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	38.7
Intersection Capacity Utilization			70.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

34: Tulare St & First St
























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	347	591	88	93	701	164	388	274	27	275	410	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3439		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3439		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	642	96	101	762	178	422	298	29	299	446	305
RTOR Reduction (vph)	0	0	46	0	21	0	0	0	22	0	0	156
Lane Group Flow (vph)	377	642	50	101	919	0	422	298	7	299	446	149
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			2
Actuated Green, G (s)	9.0	33.2	33.2	5.7	29.6		10.0	21.4	21.4	11.6	22.7	22.7
Effective Green, g (s)	9.0	33.2	33.2	5.7	29.6		10.0	21.4	21.4	11.6	22.7	22.7
Actuated g/C Ratio	0.10	0.37	0.37	0.06	0.33		0.11	0.24	0.24	0.13	0.25	0.25
Clearance Time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.2		2.0	5.0	5.0	2.0	5.2	5.2
Lane Grp Cap (vph)	347	1319	590	220	1142		385	850	380	447	902	403
v/s Ratio Prot	c0.11	c0.18		0.03	c0.27		c0.12	0.08		0.09	c0.13	
v/s Ratio Perm			0.03						0.00			0.09
v/c Ratio	1.09	0.49	0.09	0.46	0.80		1.10	0.35	0.02	0.67	0.49	0.37
Uniform Delay, d1	40.0	21.4	18.1	40.2	27.1		39.5	28.1	25.8	36.9	28.3	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	73.4	0.6	0.1	0.6	4.9		74.3	0.5	0.0	2.9	1.0	1.3
Delay (s)	113.5	22.0	18.2	40.8	32.0		113.8	28.6	25.9	39.9	29.3	28.6
Level of Service	F	C	B	D	C		F	C	C	D	C	C
Approach Delay (s)		52.6			32.8			76.5			32.1	
Approach LOS		D			C			E			C	
Intersection Summary												
HCM Average Control Delay			46.5			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			89.1			Sum of lost time (s)			17.5			
Intersection Capacity Utilization			71.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Tulare St & First Street


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	566	842	174	138	696	182	359	765	48	451	789	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3429		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3429		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	615	915	189	150	757	198	390	832	52	490	858	189
RTOR Reduction (vph)	0	0	62	0	22	0	0	0	19	0	0	100
Lane Group Flow (vph)	615	915	127	150	933	0	390	832	33	490	858	89
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			2
Actuated Green, G (s)	18.0	39.1	39.1	8.2	29.0		12.0	25.5	25.5	15.0	28.2	28.2
Effective Green, g (s)	18.0	39.1	39.1	8.2	29.0		12.0	25.5	25.5	15.0	28.2	28.2
Actuated g/C Ratio	0.17	0.37	0.37	0.08	0.28		0.11	0.24	0.24	0.14	0.27	0.27
Clearance Time (s)	4.0	4.6	4.6	4.0	4.9		4.0	4.6	4.6	4.0	4.9	4.9
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.2		2.0	5.0	5.0	2.0	5.2	5.2
Lane Grp Cap (vph)	589	1318	589	268	947		392	859	384	490	950	425
v/s Ratio Prot	c0.18	0.26		0.04	c0.27		0.11	0.24		c0.14	c0.24	
v/s Ratio Perm			0.08						0.02			0.06
v/c Ratio	1.04	0.69	0.22	0.56	0.98		0.99	0.97	0.09	1.00	0.90	0.21
Uniform Delay, d1	43.5	27.9	22.5	46.7	37.8		46.5	39.4	30.7	45.0	37.1	29.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	49.1	2.0	0.4	1.4	25.5		43.8	23.4	0.2	40.7	12.5	0.5
Delay (s)	92.6	29.9	22.9	48.1	63.3		90.3	62.7	30.9	85.7	49.6	30.3
Level of Service	F	C	C	D	E		F	E	C	F	D	C
Approach Delay (s)		51.6			61.2			69.9			58.7	
Approach LOS		D			E			E			E	
Intersection Summary												
HCM Average Control Delay			59.5			HCM Level of Service				E		
HCM Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			105.0			Sum of lost time (s)				17.8		
Intersection Capacity Utilization			89.8%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: H St & Mariposa St


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	783	94	68	195	147	8	106	9	83	64	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.91			0.95			1.00			1.00	
Frt		0.98			0.95			0.99			0.91	
Flt Protected		1.00			0.99			1.00			0.99	
Satd. Flow (prot)		5004			3321			1838			1686	
Flt Permitted		1.00			0.73			0.97			0.91	
Satd. Flow (perm)		5004			2437			1785			1542	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	851	102	74	212	160	9	115	10	90	70	278
RTOR Reduction (vph)	0	25	0	0	81	0	0	5	0	0	103	0
Lane Group Flow (vph)	0	928	0	0	365	0	0	129	0	0	335	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		29.0			29.0			21.0			21.0	
Effective Green, g (s)		29.0			29.0			21.0			21.0	
Actuated g/C Ratio		0.49			0.49			0.36			0.36	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)		2460			1198			635			549	
v/s Ratio Prot		c0.19										
v/s Ratio Perm					0.15			0.07			c0.22	
v/c Ratio		0.38			0.30			0.20			0.61	
Uniform Delay, d1		9.4			9.0			13.2			15.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			0.1			0.1			1.4	
Delay (s)		9.4			9.0			13.3			17.0	
Level of Service		A			A			B			B	
Approach Delay (s)		9.4			9.0			13.3			17.0	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			11.3			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			59.0			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			89.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: H St & Mariposa St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	732	27	31	380	217	121	147	33	41	8	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5			4.5			4.5			4.5	
Lane Util. Factor	1.00	0.91			0.95			1.00			1.00	
Frt	1.00	0.99			0.95			0.99			0.90	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	5058			3347			1799			1664	
Flt Permitted	0.35	1.00			0.89			0.81			0.88	
Satd. Flow (perm)	655	5058			2983			1493			1482	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	796	29	34	413	236	132	160	36	45	9	132
RTOR Reduction (vph)	0	7	0	0	117	0	0	7	0	0	85	0
Lane Group Flow (vph)	120	818	0	0	566	0	0	321	0	0	101	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	29.0	29.0			29.0			21.0			21.0	
Effective Green, g (s)	29.0	29.0			29.0			21.0			21.0	
Actuated g/C Ratio	0.49	0.49			0.49			0.36			0.36	
Clearance Time (s)	4.5	4.5			4.5			4.5			4.5	
Vehicle Extension (s)	0.2	0.2			0.2			0.2			0.2	
Lane Grp Cap (vph)	322	2486			1466			531			527	
v/s Ratio Prot		0.16										
v/s Ratio Perm	0.18				c0.19			c0.21			0.07	
v/c Ratio	0.37	0.33			0.39			0.60			0.19	
Uniform Delay, d1	9.3	9.1			9.4			15.6			13.1	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.3	0.0			0.1			1.3			0.1	
Delay (s)	9.6	9.1			9.5			16.9			13.2	
Level of Service	A	A			A			B			B	
Approach Delay (s)		9.2			9.5			16.9			13.2	
Approach LOS		A			A			B			B	






















Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

36: C Street & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	128	21	49	40	25	39	83	1201	31	93	906	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1693		1770	3526		1770	3474	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.21	1.00		0.15	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1693		383	3526		275	3474	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	23	53	43	27	42	90	1305	34	101	985	138
RTOR Reduction (vph)	0	0	46	0	38	0	0	1	0	0	10	0
Lane Group Flow (vph)	139	23	7	43	31	0	90	1338	0	101	1113	0
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	8.1	10.4	10.4	4.0	6.3		47.3	47.3		47.3	47.3	
Effective Green, g (s)	8.1	10.4	10.4	4.0	6.3		47.3	47.3		47.3	47.3	
Actuated g/C Ratio	0.11	0.14	0.14	0.05	0.09		0.64	0.64		0.64	0.64	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	193	281	222	96	144		244	2251		176	2218	
v/s Ratio Prot	c0.08	0.01		0.02	c0.02			c0.38			0.32	
v/s Ratio Perm			0.00				0.23			0.37		
v/c Ratio	0.72	0.09	0.03	0.45	0.21		0.37	0.59		0.57	0.50	
Uniform Delay, d1	31.9	27.7	27.5	34.0	31.6		6.3	7.8		7.6	7.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.6	0.1	0.0	1.2	0.3		2.6	0.8		8.7	0.5	
Delay (s)	42.5	27.8	27.5	35.2	31.9		9.0	8.6		16.4	7.6	
Level of Service	D	C	C	D	C		A	A		B	A	
Approach Delay (s)		37.3			33.1			8.6			8.4	
Approach LOS		D			C			A			A	

Intersection Summary






















HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	12.4
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

36: C Street & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	253	99	338	379	189	77	158	1201	50	104	1312	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1782		1770	3518		1770	3472	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.07	1.00		0.10	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1782		125	3518		192	3472	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	108	367	412	205	84	172	1305	54	113	1426	207
RTOR Reduction (vph)	0	0	24	0	13	0	0	3	0	0	10	0
Lane Group Flow (vph)	275	108	343	412	276	0	172	1356	0	113	1623	0
Turn Type	Prot		Perm	Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	15.0	21.8	21.8	16.0	22.8		59.8	59.8		59.8	59.8	
Effective Green, g (s)	15.0	21.8	21.8	16.0	22.8		59.8	59.8		59.8	59.8	
Actuated g/C Ratio	0.14	0.20	0.20	0.15	0.21		0.54	0.54		0.54	0.54	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.2	4.2		4.2	4.2	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	241	369	314	257	369		68	1913		104	1888	
v/s Ratio Prot	0.16	0.06		c0.23	0.15			0.39			0.47	
v/s Ratio Perm			c0.22				c1.38			0.59		
v/c Ratio	1.14	0.29	1.09	1.60	0.75		2.53	0.71		1.09	0.86	
Uniform Delay, d1	47.5	37.5	44.1	47.0	40.9		25.1	18.6		25.1	21.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	101.3	0.2	77.7	288.9	7.0		729.5	1.8		113.5	4.8	
Delay (s)	148.8	37.7	121.8	335.9	47.9		754.6	20.4		138.6	26.3	
Level of Service	F	D	F	F	D		F	C		F	C	
Approach Delay (s)		119.6			217.2			102.9			33.5	
Approach LOS		F			F			F			C	



















Intersection Summary

HCM Average Control Delay	96.9	HCM Level of Service	F
HCM Volume to Capacity ratio	2.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

37: 99 SB Off-Ramp & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	552	485	409	0	0	0	0	854	458	237	635	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00	1.00					0.95		1.00	0.95	
Frt	1.00	1.00	0.85					0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3354		1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583					3354		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	600	527	445	0	0	0	0	928	498	258	690	0
RTOR Reduction (vph)	0	0	160	0	0	0	0	65	0	0	0	0
Lane Group Flow (vph)	600	527	285	0	0	0	0	1361	0	258	690	0
Turn Type	Split		Perm							Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	35.5	35.5	35.5					43.6		15.8	64.6	
Effective Green, g (s)	35.5	35.5	35.5					43.6		15.8	64.6	
Actuated g/C Ratio	0.32	0.32	0.32					0.40		0.14	0.59	
Clearance Time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Vehicle Extension (s)	6.2	6.2	6.2					0.2		2.0	0.2	
Lane Grp Cap (vph)	571	601	511					1329		254	2078	
v/s Ratio Prot	c0.34	0.28						c0.41		c0.15	0.19	
v/s Ratio Perm			0.18									
v/c Ratio	1.05	0.88	0.56					1.02		1.02	0.33	
Uniform Delay, d1	37.2	35.2	30.8					33.2		47.1	11.6	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	51.7	15.3	3.0					31.1		60.6	0.0	
Delay (s)	88.9	50.4	33.7					64.3		107.7	11.7	
Level of Service	F	D	C					E		F	B	
Approach Delay (s)		60.4			0.0			64.3			37.8	
Approach LOS		E			A			E			D	
Intersection Summary												
HCM Average Control Delay			56.4									
HCM Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			110.0									
Intersection Capacity Utilization			112.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: 99 SB Off-Ramp & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	214	721	790	0	0	0	0	999	479	335	732	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Lane Util. Factor	1.00	1.00	1.00					0.95		1.00	0.95	
Frt	1.00	1.00	0.85					0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583					3367		1770	3539	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583					3367		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	784	859	0	0	0	0	1086	521	364	796	0
RTOR Reduction (vph)	0	0	119	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	233	784	740	0	0	0	0	1573	0	364	796	0
Turn Type	Split		Perm							Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	52.3	52.3	52.3					57.8		24.8	87.8	
Effective Green, g (s)	52.3	52.3	52.3					57.8		24.8	87.8	
Actuated g/C Ratio	0.35	0.35	0.35					0.39		0.17	0.59	
Clearance Time (s)	4.7	4.7	4.7					5.2		5.2	5.2	
Vehicle Extension (s)	6.2	6.2	6.2					0.2		2.0	0.2	
Lane Grp Cap (vph)	617	650	552					1297		293	2071	
v/s Ratio Prot	0.13	0.42						c0.47		c0.21	0.22	
v/s Ratio Perm			c0.47									
v/c Ratio	0.38	1.21	1.34					1.21		1.24	0.38	
Uniform Delay, d1	36.6	48.9	48.9					46.1		62.6	16.6	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	1.1	106.8	165.0					103.2		134.6	0.0	
Delay (s)	37.8	155.7	213.9					149.3		197.2	16.7	
Level of Service	D	F	F					F		F	B	
Approach Delay (s)		167.7			0.0			149.3			73.3	
Approach LOS		F			A			F			E	
Intersection Summary												
HCM Average Control Delay			137.7									
HCM Volume to Capacity ratio			1.27									
Actuated Cycle Length (s)			150.0							15.1		
Intersection Capacity Utilization			129.1%							H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 99 NB On-Ramp & Fresno



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	352	517	388	643	770	0	0	512	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3469	1583	1770	3539			3539	1583
Flt Permitted					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					3469	1583	1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	383	562	422	699	837	0	0	557	224
RTOR Reduction (vph)	0	0	0	0	0	128	0	0	0	0	0	72
Lane Group Flow (vph)	0	0	0	0	945	294	699	837	0	0	557	152
Turn Type				Split		Perm	Prot					Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8						6
Actuated Green, G (s)					32.0	32.0	41.3	64.4			19.4	19.4
Effective Green, g (s)					32.0	32.0	41.3	64.4			19.4	19.4
Actuated g/C Ratio					0.30	0.30	0.39	0.60			0.18	0.18
Clearance Time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Vehicle Extension (s)					5.0	5.0	2.0	0.2			0.2	0.2
Lane Grp Cap (vph)					1037	473	683	2130			642	287
v/s Ratio Prot					c0.27		c0.40	0.24			c0.16	
v/s Ratio Perm						0.19						0.10
v/c Ratio					0.91	0.62	1.02	0.39			0.87	0.53
Uniform Delay, d1					36.1	32.3	32.9	11.1			42.6	39.7
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					12.4	3.6	40.5	0.0			11.5	0.8
Delay (s)					48.5	35.9	73.4	11.2			54.1	40.5
Level of Service					D	D	E	B			D	D
Approach Delay (s)		0.0			44.6			39.5			50.2	
Approach LOS		A			D			D			D	
Intersection Summary												
HCM Average Control Delay			43.6		HCM Level of Service					D		
HCM Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			107.0		Sum of lost time (s)					14.3		
Intersection Capacity Utilization			112.6%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 99 NB On-Ramp & Fresno




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	335	511	585	647	557	0	0	722	925
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	1.00
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					3470	1583	1770	3539			3539	1583
Flt Permitted					0.98	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					3470	1583	1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	364	555	636	703	605	0	0	785	1005
RTOR Reduction (vph)	0	0	0	0	0	274	0	0	0	0	0	20
Lane Group Flow (vph)	0	0	0	0	919	362	703	605	0	0	785	985
Turn Type				Split		Perm	Prot					Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8						6
Actuated Green, G (s)					34.6	34.6	38.3	104.8			62.8	62.8
Effective Green, g (s)					34.6	34.6	38.3	104.8			62.8	62.8
Actuated g/C Ratio					0.23	0.23	0.26	0.70			0.42	0.42
Clearance Time (s)					5.4	5.4	3.7	5.2			5.2	5.2
Vehicle Extension (s)					5.0	5.0	2.0	0.2			0.2	0.2
Lane Grp Cap (vph)					800	365	452	2473			1482	663
v/s Ratio Prot					c0.26		c0.40	0.17			0.22	
v/s Ratio Perm						0.23						c0.62
v/c Ratio					1.15	0.99	1.56	0.24			0.53	1.49
Uniform Delay, d1					57.7	57.6	55.9	8.2			32.6	43.6
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					81.3	44.9	260.6	0.0			0.2	226.7
Delay (s)					139.0	102.5	316.4	8.2			32.7	270.3
Level of Service					F	F	F	A			C	F
Approach Delay (s)		0.0			124.0			173.9			166.1	
Approach LOS		A			F			F			F	
Intersection Summary												
HCM Average Control Delay			154.2		HCM Level of Service						F	
HCM Volume to Capacity ratio			1.42									
Actuated Cycle Length (s)			150.0		Sum of lost time (s)					14.3		
Intersection Capacity Utilization			129.1%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

39: G St & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	63	185	132	17	164	29	0	1018	29	0	482	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Lane Util. Factor	1.00	0.95	1.00		0.95			0.95			0.95	1.00
Frt	1.00	1.00	0.85		0.98			1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00			1.00			1.00	1.00
Satd. Flow (prot)	1770	3539	1583		3451			3524			3539	1583
Flt Permitted	0.61	1.00	1.00		0.92			1.00			1.00	1.00
Satd. Flow (perm)	1135	3539	1583		3181			3524			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	201	143	18	178	32	0	1107	32	0	524	132
RTOR Reduction (vph)	0	0	116	0	26	0	0	2	0	0	0	48
Lane Group Flow (vph)	68	201	27	0	202	0	0	1137	0	0	524	84
Turn Type	Perm		Perm	Perm								Perm
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4								2
Actuated Green, G (s)	9.2	9.2	9.2		9.2			31.1			31.1	31.1
Effective Green, g (s)	9.2	9.2	9.2		9.2			31.1			31.1	31.1
Actuated g/C Ratio	0.19	0.19	0.19		0.19			0.63			0.63	0.63
Clearance Time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0			5.0			5.0	5.0
Lane Grp Cap (vph)	213	664	297		597			2237			2246	1005
v/s Ratio Prot		0.06						0.32			0.15	
v/s Ratio Perm	0.06		0.02		0.06							0.05
v/c Ratio	0.32	0.30	0.09		0.34			0.51			0.23	0.08
Uniform Delay, d1	17.2	17.1	16.4		17.3			4.8			3.8	3.5
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.1	0.0		0.1			0.4			0.1	0.1
Delay (s)	17.5	17.2	16.5		17.4			5.2			3.9	3.5
Level of Service	B	B	B		B			A			A	A
Approach Delay (s)		17.0			17.4			5.2			3.9	
Approach LOS		B			B			A			A	

Intersection Summary




















HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: G St & Fresno




















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	79	640	97	37	633	68	0	755	88	0	1406	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Lane Util. Factor	1.00	0.95	1.00		0.95			0.95			0.95	1.00
Frt	1.00	1.00	0.85		0.99			0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00			1.00			1.00	1.00
Satd. Flow (prot)	1770	3539	1583		3482			3484			3539	1583
Flt Permitted	0.22	1.00	1.00		0.89			1.00			1.00	1.00
Satd. Flow (perm)	414	3539	1583		3112			3484			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	696	105	40	688	74	0	821	96	0	1528	346
RTOR Reduction (vph)	0	0	10	0	12	0	0	13	0	0	0	47
Lane Group Flow (vph)	86	696	95	0	790	0	0	904	0	0	1528	299
Turn Type	Perm		Perm	Perm								Perm
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4								2
Actuated Green, G (s)	22.1	22.1	22.1		22.1			32.1			32.1	32.1
Effective Green, g (s)	22.1	22.1	22.1		22.1			32.1			32.1	32.1
Actuated g/C Ratio	0.35	0.35	0.35		0.35			0.51			0.51	0.51
Clearance Time (s)	4.5	4.5	4.5		4.5			4.2			4.2	4.2
Vehicle Extension (s)	2.0	2.0	2.0		2.0			5.0			5.0	5.0
Lane Grp Cap (vph)	145	1243	556		1093			1778			1806	808
v/s Ratio Prot		0.20						0.26			0.43	
v/s Ratio Perm	0.21		0.06		0.25							0.19
v/c Ratio	0.59	0.56	0.17		0.72			0.51			0.85	0.37
Uniform Delay, d1	16.7	16.5	14.1		17.7			10.2			13.3	9.3
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2	4.3	0.3	0.1		2.0			0.5			4.3	0.6
Delay (s)	21.0	16.8	14.1		19.8			10.7			17.5	9.9
Level of Service	C	B	B		B			B			B	A
Approach Delay (s)		16.9			19.8			10.7			16.1	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			15.8			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			62.9			Sum of lost time (s)					8.7	
Intersection Capacity Utilization			88.3%			ICU Level of Service					E	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno



4/25/2011

												
Movement	SEL	SET	SER	NWL2	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	57	23	19	14	1	3	50	72	751	82	96	511
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	12	12
Total Lost time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Lane Util. Factor	1.00	1.00			1.00	1.00			0.95		1.00	1.00
Frt	1.00	0.93			1.00	0.86			0.99		1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00			1.00		0.95	1.00
Satd. Flow (prot)	1770	1735			1947	1598			3477		1770	1863
Flt Permitted	1.00	1.00			1.00	1.00			0.88		0.28	1.00
Satd. Flow (perm)	1863	1735			2049	1598			3067		528	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	25	21	15	1	3	54	78	816	89	104	555
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	8	0	0	0
Lane Group Flow (vph)	62	46	0	0	16	9	0	0	975	0	104	555
Turn Type	Perm			Perm	Perm			Perm			Perm	
Protected Phases		4				4			2			2
Permitted Phases	4			4	4			2			2	
Actuated Green, G (s)	3.7	3.7			3.7	3.7			20.0		20.0	20.0
Effective Green, g (s)	3.7	3.7			3.7	3.7			20.0		20.0	20.0
Actuated g/C Ratio	0.11	0.11			0.11	0.11			0.60		0.60	0.60
Clearance Time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Vehicle Extension (s)	0.2	0.2			0.2	0.2			0.2		0.2	0.2
Lane Grp Cap (vph)	207	193			228	178			1842		317	1119
v/s Ratio Prot		0.03				0.01						0.30
v/s Ratio Perm	c0.03				0.01				c0.32		0.20	
w/c Ratio	0.30	0.24			0.07	0.05			0.53		0.33	0.50
Uniform Delay, d1	13.6	13.5			13.3	13.2			3.9		3.3	3.8
Progression Factor	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Incremental Delay, d2	0.3	0.2			0.0	0.0			0.1		0.2	0.1
Delay (s)	13.9	13.7			13.3	13.3			4.0		3.5	3.9
Level of Service	B	B			B	B			A		A	A
Approach Delay (s)		13.8				13.3			4.0			3.8
Approach LOS		B				B			A			A
Intersection Summary												
HCM Average Control Delay			4.8		HCM Level of Service				A			
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			33.3		Sum of lost time (s)				9.6			
Intersection Capacity Utilization			74.2%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno




















4/25/2011

		
Movement	SWR	SWR2
Lane Configurations	2	
Volume (vph)	5	47
Ideal Flow (vphpl)	1900	1900
Lane Width	15	12
Total Lost time (s)	4.8	
Lane Util. Factor	1.00	
Frt	0.85	
Flt Protected	1.00	
Satd. Flow (prot)	1742	
Flt Permitted	1.00	
Satd. Flow (perm)	1742	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	5	51
RTOR Reduction (vph)	20	0
Lane Group Flow (vph)	36	0
Turn Type	Perm	
Protected Phases		
Permitted Phases	2	
Actuated Green, G (s)	20.0	
Effective Green, g (s)	20.0	
Actuated g/C Ratio	0.60	
Clearance Time (s)	4.8	
Vehicle Extension (s)	0.2	
Lane Grp Cap (vph)	1046	
v/s Ratio Prot		
v/s Ratio Perm	0.02	
v/c Ratio	0.03	
Uniform Delay, d1	2.7	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	2.7	
Level of Service	A	
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno

4/25/2011

												
Movement	SEL	SET	SER	NWL2	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	69	8	63	117	4	90	176	80	636	39	165	1020
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	15	12	12	12	12	12	12	12
Total Lost time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Lane Util. Factor	1.00	1.00			1.00	1.00			0.95		1.00	1.00
Frt	1.00	0.87			1.00	0.90			0.99		1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00			0.99		0.95	1.00
Satd. Flow (prot)	1770	1616			1947	1678			3493		1770	1863
Flt Permitted	0.37	1.00			0.71	1.00			0.65		0.33	1.00
Satd. Flow (perm)	696	1616			1448	1678			2272		618	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	9	68	127	4	98	191	87	691	42	179	1109
RTOR Reduction (vph)	0	0	0	0	0	98	0	0	3	0	0	0
Lane Group Flow (vph)	75	77	0	0	131	191	0	0	817	0	179	1109
Turn Type	Perm			Perm	Perm			Perm			Perm	
Protected Phases		4				4			2			2
Permitted Phases	4			4	4			2			2	
Actuated Green, G (s)	10.7	10.7			10.7	10.7			51.8		51.8	51.8
Effective Green, g (s)	10.7	10.7			10.7	10.7			51.8		51.8	51.8
Actuated g/C Ratio	0.15	0.15			0.15	0.15			0.72		0.72	0.72
Clearance Time (s)	4.8	4.8			4.8	4.8			4.8		4.8	4.8
Vehicle Extension (s)	0.2	0.2			0.2	0.2			0.2		0.2	0.2
Lane Grp Cap (vph)	103	240			215	249			1632		444	1338
v/s Ratio Prot		0.05				c0.11						c0.60
v/s Ratio Perm	0.11				0.09				0.36		0.29	
v/c Ratio	0.73	0.32			0.61	0.77			0.50		0.40	0.83
Uniform Delay, d1	29.3	27.5			28.7	29.5			4.5		4.0	7.1
Progression Factor	1.00	1.00			1.00	1.00			1.00		1.00	1.00
Incremental Delay, d2	19.4	0.3			3.3	12.0			0.1		0.2	4.2
Delay (s)	48.7	27.7			32.1	41.5			4.6		4.2	11.2
Level of Service	D	C			C	D			A		A	B
Approach Delay (s)		38.1				38.5			4.6			8.3
Approach LOS		D				D			A			A
Intersection Summary												
HCM Average Control Delay			12.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			72.1			Sum of lost time (s)			9.6			
Intersection Capacity Utilization			110.2%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: To H St & Fresno





















4/25/2011

Movement	SWR	SWR2
Lane Configurations	1	1
Volume (vph)	37	467
Ideal Flow (vphpl)	1900	1900
Lane Width	15	12
Total Lost time (s)	4.8	
Lane Util. Factor	1.00	
Frt	0.85	
Flt Protected	1.00	
Satd. Flow (prot)	1742	
Flt Permitted	1.00	
Satd. Flow (perm)	1742	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	40	508
RTOR Reduction (vph)	143	0
Lane Group Flow (vph)	405	0
Turn Type	Perm	
Protected Phases		
Permitted Phases	2	
Actuated Green, G (s)	51.8	
Effective Green, g (s)	51.8	
Actuated g/C Ratio	0.72	
Clearance Time (s)	4.8	
Vehicle Extension (s)	0.2	
Lane Grp Cap (vph)	1252	
v/s Ratio Prot		
v/s Ratio Perm	0.23	
v/c Ratio	0.32	
Uniform Delay, d1	3.7	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	3.8	
Level of Service	A	
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

42: Van Ness Ave & Fresno





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	214	156	123	99	254	183	125	601	92	64	436	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.94		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1740		1770	3317		1770	3469		1770	3422	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1740		1770	3317		1770	3469		1770	3422	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	170	134	108	276	199	136	653	100	70	474	134
RTOR Reduction (vph)	0	34	0	0	154	0	0	14	0	0	30	0
Lane Group Flow (vph)	233	270	0	108	321	0	136	739	0	70	578	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.3	22.0		7.9	17.6		8.1	24.8		5.9	22.6	
Effective Green, g (s)	12.3	22.0		7.9	17.6		8.1	24.8		5.9	22.6	
Actuated g/C Ratio	0.16	0.28		0.10	0.23		0.10	0.32		0.08	0.29	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	282	496		181	756		186	1114		135	1002	
v/s Ratio Prot	c0.13	c0.16		0.06	0.10		c0.08	c0.21		0.04	0.17	
v/s Ratio Perm												
v/c Ratio	0.83	0.55		0.60	0.43		0.73	0.66		0.52	0.58	
Uniform Delay, d1	31.4	23.4		33.1	25.5		33.5	22.6		34.3	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.6	2.2		5.2	0.8		13.8	2.0		3.3	1.3	
Delay (s)	49.0	25.5		38.3	26.3		47.3	24.6		37.6	24.5	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		35.7			28.5			28.1			25.9	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			29.1			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			77.2			Sum of lost time (s)			8.2			
Intersection Capacity Utilization			61.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Van Ness Ave & Fresno


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	106	278	190	203	416	144	201	640	136	183	1042	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1749		1770	3402		1770	3446		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1749		1770	3402		1770	3446		1770	3487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	302	207	221	452	157	218	696	148	199	1133	123
RTOR Reduction (vph)	0	23	0	0	32	0	0	17	0	0	8	0
Lane Group Flow (vph)	115	486	0	221	577	0	218	827	0	199	1248	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.3	28.1		13.1	29.9		12.9	32.4		14.8	34.3	
Effective Green, g (s)	11.3	28.1		13.1	29.9		12.9	32.4		14.8	34.3	
Actuated g/C Ratio	0.11	0.27		0.12	0.28		0.12	0.31		0.14	0.33	
Clearance Time (s)	4.1	4.2		4.1	4.2		4.1	4.2		4.1	4.2	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	190	468		221	969		217	1063		249	1139	
v/s Ratio Prot	0.06	c0.28		c0.12	0.17		c0.12	0.24		0.11	c0.36	
v/s Ratio Perm												
v/c Ratio	0.61	1.04		1.00	0.60		1.00	0.78		0.80	1.10	
Uniform Delay, d1	44.7	38.5		46.0	32.3		46.0	33.0		43.7	35.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	51.7		60.5	1.5		62.3	4.3		16.2	56.8	
Delay (s)	50.1	90.1		106.5	33.8		108.3	37.3		59.9	92.1	
Level of Service	D	F		F	C		F	D		E	F	
Approach Delay (s)		82.7			53.2			51.9			87.7	
Approach LOS		F			D			D			F	
Intersection Summary												
HCM Average Control Delay			70.1			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			105.0			Sum of lost time (s)			12.4			
Intersection Capacity Utilization			94.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: M St & Fresno


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	126	893	99	0	0	0	0	389	213	246	574	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.95		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5054	1583					3351		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.37	1.00	
Satd. Flow (perm)		5054	1583					3351		690	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	971	108	0	0	0	0	423	232	267	624	0
RTOR Reduction (vph)	0	0	72	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	1108	36	0	0	0	0	645	0	267	624	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			2	
Permitted Phases			4							2		
Actuated Green, G (s)		20.0	20.0					31.2		31.2	31.2	
Effective Green, g (s)		20.0	20.0					31.2		31.2	31.2	
Actuated g/C Ratio		0.34	0.34					0.52		0.52	0.52	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1696	531					1754		361	1853	
v/s Ratio Prot		c0.22						0.19			0.18	
v/s Ratio Perm			0.02							c0.39		
v/c Ratio		0.65	0.07					0.37		0.74	0.34	
Uniform Delay, d1		16.8	13.5					8.4		11.0	8.2	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0					0.0		6.7	0.0	
Delay (s)		17.5	13.5					8.4		17.7	8.3	
Level of Service		B	B					A		B	A	
Approach Delay (s)		17.2			0.0			8.4			11.1	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM Average Control Delay			13.1		HCM Level of Service						B	
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			59.6		Sum of lost time (s)						8.4	
Intersection Capacity Utilization			82.0%		ICU Level of Service						D	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: M St & Fresno


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	228	982	77	0	0	0	0	787	255	327	1131	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2					4.2		4.2	4.2	
Lane Util. Factor		0.91	1.00					0.95		1.00	0.95	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		5038	1583					3409		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.20	1.00	
Satd. Flow (perm)		5038	1583					3409		369	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	1067	84	0	0	0	0	855	277	355	1229	0
RTOR Reduction (vph)	0	0	38	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	1315	46	0	0	0	0	1130	0	355	1229	0
Turn Type	Split		Perm							Perm		
Protected Phases	4	4						2			2	
Permitted Phases			4							2		
Actuated Green, G (s)		20.0	20.0					46.6		46.6	46.6	
Effective Green, g (s)		20.0	20.0					46.6		46.6	46.6	
Actuated g/C Ratio		0.27	0.27					0.62		0.62	0.62	
Clearance Time (s)		4.2	4.2					4.2		4.2	4.2	
Vehicle Extension (s)		0.2	0.2					0.2		0.2	0.2	
Lane Grp Cap (vph)		1343	422					2118		229	2199	
v/s Ratio Prot		0.26						0.33			0.35	
v/s Ratio Perm			0.03							0.96		
v/c Ratio		0.98	0.11					0.53		1.55	0.56	
Uniform Delay, d1		27.3	20.8					8.0		14.2	8.2	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		19.4	0.0					0.1		268.1	0.2	
Delay (s)		46.7	20.8					8.2		282.3	8.4	
Level of Service		D	C					A		F	A	
Approach Delay (s)		45.1			0.0			8.2			69.8	
Approach LOS		D			A			A			E	
Intersection Summary												
HCM Average Control Delay			44.5		HCM Level of Service						D	
HCM Volume to Capacity ratio			1.38									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)					8.4		
Intersection Capacity Utilization			98.1%		ICU Level of Service					F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

44: P St & Fresno


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	64	221	90	45	609	0	0	996	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	15	15	15	12	12	15	15	12	12
Total Lost time (s)					4.2		4.2	4.2			4.2	4.2
Lane Util. Factor					0.95		1.00	0.95			0.95	1.00
Frt					0.96		1.00	1.00			1.00	0.85
Flt Protected					0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)					3721		1770	3539			3539	1583
Flt Permitted					0.99		0.16	1.00			1.00	1.00
Satd. Flow (perm)					3721		304	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	240	98	49	662	0	0	1083	218
RTOR Reduction (vph)	0	0	0	0	50	0	0	0	0	0	0	117
Lane Group Flow (vph)	0	0	0	0	358	0	49	662	0	0	1083	101
Turn Type				Split			Perm					Perm
Protected Phases				2	2			4			4	
Permitted Phases							4					4
Actuated Green, G (s)					23.0		27.2	27.2			27.2	27.2
Effective Green, g (s)					23.0		27.2	27.2			27.2	27.2
Actuated g/C Ratio					0.39		0.46	0.46			0.46	0.46
Clearance Time (s)					4.2		4.2	4.2			4.2	4.2
Vehicle Extension (s)					0.2		0.2	0.2			0.2	0.2
Lane Grp Cap (vph)					1460		141	1643			1643	735
v/s Ratio Prot					c0.10			0.19			c0.31	
v/s Ratio Perm							0.16					0.06
v/c Ratio					0.24		0.35	0.40			0.66	0.14
Uniform Delay, d1					12.0		10.0	10.3			12.1	9.0
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					0.0		0.5	0.1			0.7	0.0
Delay (s)					12.0		10.6	10.4			12.9	9.0
Level of Service					B		B	B			B	A
Approach Delay (s)		0.0			12.0			10.4			12.2	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			11.7		HCM Level of Service						B	
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			58.6		Sum of lost time (s)						8.4	
Intersection Capacity Utilization			82.0%		ICU Level of Service						D	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

44: P St & Fresno























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	57	693	262	94	1442	0	0	1307	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	15	15	15	12	12	15	15	12	12
Total Lost time (s)					4.2		4.2	4.2			4.2	
Lane Util. Factor					0.95		1.00	0.95			0.91	
Frt					0.96		1.00	1.00			0.96	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					3731		1770	3539			4882	
Flt Permitted					1.00		0.11	1.00			1.00	
Satd. Flow (perm)					3731		197	3539			4882	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	62	753	285	102	1567	0	0	1421	517
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	26	0
Lane Group Flow (vph)	0	0	0	0	1086	0	102	1567	0	0	1912	0
Turn Type				Split			Perm					
Protected Phases				2	2			4			4	
Permitted Phases							4					
Actuated Green, G (s)					23.5		37.8	37.8			37.8	
Effective Green, g (s)					23.5		37.8	37.8			37.8	
Actuated g/C Ratio					0.34		0.54	0.54			0.54	
Clearance Time (s)					4.2		4.2	4.2			4.2	
Vehicle Extension (s)					0.2		0.2	0.2			0.2	
Lane Grp Cap (vph)					1258		107	1919			2648	
v/s Ratio Prot					c0.29			0.44			0.39	
v/s Ratio Perm							c0.52					
v/c Ratio					0.86		0.95	0.82			0.72	
Uniform Delay, d1					21.6		15.1	13.1			12.0	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					6.1		71.2	2.7			0.8	
Delay (s)					27.7		86.3	15.8			12.8	
Level of Service					C		F	B			B	
Approach Delay (s)		0.0			27.7			20.1			12.8	
Approach LOS		A			C			C			B	
Intersection Summary												
HCM Average Control Delay			18.9			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			69.7			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			98.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

45: R Street & Fresno























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	158	183	295	99	180	53	300	387	32	68	856	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1799		1770	5027		1770	3539	1583
Flt Permitted	0.42	1.00	1.00	0.51	1.00		0.27	1.00		0.48	1.00	1.00
Satd. Flow (perm)	778	1863	1583	957	1799		500	5027		894	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	172	199	321	108	196	58	326	421	35	74	930	243
RTOR Reduction (vph)	0	0	126	0	10	0	0	10	0	0	0	84
Lane Group Flow (vph)	172	199	195	108	244	0	326	446	0	74	930	159
Turn Type	Perm		Perm	Perm			Perm			Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2	2	2	2			4			4		4
Actuated Green, G (s)	25.3	25.3	25.3	25.3	25.3		65.5	65.5		65.5	65.5	65.5
Effective Green, g (s)	25.3	25.3	25.3	25.3	25.3		65.5	65.5		65.5	65.5	65.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.66	0.66		0.66	0.66	0.66
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	197	472	401	243	456		328	3299		587	2323	1039
v/s Ratio Prot		0.11			0.14			0.09			0.26	
v/s Ratio Perm	c0.22		0.12	0.11			c0.65			0.08		0.10
v/c Ratio	0.87	0.42	0.49	0.44	0.53		0.99	0.14		0.13	0.40	0.15
Uniform Delay, d1	35.7	31.1	31.7	31.3	32.2		17.0	6.5		6.4	8.0	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.2	0.2	0.3	0.5	0.6		47.7	0.0		0.0	0.0	0.0
Delay (s)	66.9	31.4	32.1	31.8	32.8		64.7	6.5		6.5	8.0	6.6
Level of Service	E	C	C	C	C		E	A		A	A	A
Approach Delay (s)		40.5			32.5			30.7			7.7	
Approach LOS		D			C			C			A	
Intersection Summary												
HCM Average Control Delay			23.8			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			99.8			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			102.0%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

45: R Street & Fresno
























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	308	427	449	173	339	94	385	1182	166	56	1161	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1802		1770	4992		1770	3539	1583
Flt Permitted	0.26	1.00	1.00	0.27	1.00		0.13	1.00		0.12	1.00	1.00
Satd. Flow (perm)	483	1863	1583	495	1802		238	4992		224	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	335	464	488	188	368	102	418	1285	180	61	1262	310
RTOR Reduction (vph)	0	0	30	0	9	0	0	17	0	0	0	107
Lane Group Flow (vph)	335	464	458	188	461	0	418	1448	0	61	1262	203
Turn Type	Perm		Perm	Perm			Perm			Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2	2	2	2			4			4		4
Actuated Green, G (s)	41.5	41.5	41.5	41.5	41.5		59.5	59.5		59.5	59.5	59.5
Effective Green, g (s)	41.5	41.5	41.5	41.5	41.5		59.5	59.5		59.5	59.5	59.5
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38		0.54	0.54		0.54	0.54	0.54
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	182	703	597	187	680		129	2700		121	1914	856
v/s Ratio Prot		0.25			0.26			0.29			0.36	
v/s Ratio Perm	c0.69		0.29	0.38			c1.76			0.27		0.13
v/c Ratio	1.84	0.66	0.77	1.01	0.68		3.24	0.54		0.50	0.66	0.24
Uniform Delay, d1	34.2	28.4	30.0	34.2	28.7		25.2	16.3		15.9	18.0	13.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	398.8	1.8	5.3	67.2	2.1		1027.9	0.1		1.2	0.6	0.1
Delay (s)	433.1	30.2	35.3	101.5	30.8		1053.2	16.4		17.1	18.7	13.4
Level of Service	F	C	D	F	C		F	B		B	B	B
Approach Delay (s)		137.0			51.0			246.6			17.6	
Approach LOS		F			D			F			B	
Intersection Summary												
HCM Average Control Delay			128.7			HCM Level of Service				F		
HCM Volume to Capacity ratio			2.67									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			113.1%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: E Divisadero St & Fresno St.
























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (vph)	8	117	13	629	202	367	355	533	47	80	144	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.88	1.00	1.00	0.97	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	1835		1681	1724	1583	1770	2787	1583	1770	3433	1583
Flt Permitted	0.29	1.00		0.67	0.76	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	537	1835		1180	1341	1583	1770	2787	1583	1770	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	127	14	684	220	399	386	579	51	87	157	301
RTOR Reduction (vph)	0	5	0	0	0	235	0	0	33	0	0	255
Lane Group Flow (vph)	9	136	0	431	473	164	386	579	18	87	157	46
Turn Type	Perm			Perm		Perm		custom	custom	Prot		Perm
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	30.8	30.8		30.8	30.8	30.8	19.6	24.2	24.2	6.9	11.5	11.5
Effective Green, g (s)	30.8	30.8		30.8	30.8	30.8	19.6	24.2	24.2	6.9	11.5	11.5
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41	0.26	0.32	0.32	0.09	0.15	0.15
Clearance Time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	4.8	4.8	2.0	4.8	4.8
Lane Grp Cap (vph)	220	753		484	550	649	462	898	510	163	526	242
v/s Ratio Prot		0.07					c0.22	c0.21		0.05	0.05	
v/s Ratio Perm	0.02			c0.37	0.35	0.10			0.01			0.03
v/c Ratio	0.04	0.18		0.89	0.86	0.25	0.84	0.64	0.04	0.53	0.30	0.19
Uniform Delay, d1	13.3	14.1		20.6	20.2	14.6	26.2	21.8	17.5	32.6	28.2	27.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1		18.5	13.0	0.2	12.3	2.1	0.1	1.7	0.6	0.7
Delay (s)	13.4	14.2		39.1	33.2	14.8	38.6	23.9	17.5	34.2	28.8	28.5
Level of Service	B	B		D	C	B	D	C	B	C	C	C
Approach Delay (s)		14.2			29.5		29.1				29.5	
Approach LOS		B			C		C				C	
Intersection Summary												
HCM Average Control Delay			28.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			75.1			Sum of lost time (s)			8.6			
Intersection Capacity Utilization			70.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: E Divisadero St & Fresno St.

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (vph)	12	247	43	792	44	424	412	606	13	17	749	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.88	1.00	1.00	0.97	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	1821		1681	1694	1583	1770	2787	1583	1770	3433	1583
Flt Permitted	0.30	1.00		0.46	0.45	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	561	1821		815	789	1583	1770	2787	1583	1770	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	268	47	861	48	461	448	659	14	18	814	866
RTOR Reduction (vph)	0	4	0	0	0	253	0	0	4	0	0	286
Lane Group Flow (vph)	13	311	0	448	461	208	448	659	10	18	814	580
Turn Type	Perm			Perm		Perm		custom	custom	Prot		Perm
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	68.4	68.4		68.4	68.4	68.4	31.0	65.8	65.8	4.2	39.0	39.0
Effective Green, g (s)	68.4	68.4		68.4	68.4	68.4	31.0	65.8	65.8	4.2	39.0	39.0
Actuated g/C Ratio	0.45	0.45		0.45	0.45	0.45	0.20	0.43	0.43	0.03	0.26	0.26
Clearance Time (s)	4.6	4.6		4.6	4.6	4.6	4.0	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	4.8	4.8	2.0	4.8	4.8
Lane Grp Cap (vph)	253	822		368	356	714	362	1210	687	49	883	407
v/s Ratio Prot		0.17					c0.25	0.24		0.01	0.24	
v/s Ratio Perm	0.02			0.55	c0.58	0.13			0.01			c0.37
v/c Ratio	0.05	0.38		1.22	1.29	0.29	1.24	0.54	0.01	0.37	0.92	1.43
Uniform Delay, d1	23.4	27.5		41.6	41.6	26.3	60.3	31.8	24.4	72.4	54.8	56.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3		120.1	152.1	0.3	128.5	0.8	0.0	1.7	15.3	205.2
Delay (s)	23.5	27.8		161.7	193.7	26.6	188.8	32.6	24.5	74.1	70.1	261.5
Level of Service	C	C		F	F	C	F	C	C	E	E	F
Approach Delay (s)		27.6			127.0		94.9				167.7	
Approach LOS		C			F		F				F	

Intersection Summary



















HCM Average Control Delay	127.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	151.6	Sum of lost time (s)	13.2
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

47: Broadway St & Fresno St


















4/25/2011

												
Movement	WBL2	WBL	WBR	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations												
Volume (vph)	15	9	64	0	0	83	622	69	0	311	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	15	12	15	15	12	12	15	15	12	12	
Total Lost time (s)		4.5	4.5			4.5	4.5			4.5	4.5	
Lane Util. Factor		1.00	1.00			1.00	0.95			0.95	1.00	
Frt		1.00	0.85			1.00	0.99			1.00	0.85	
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00	
Satd. Flow (prot)		1947	1583			1770	3486			3539	1583	
Flt Permitted		0.70	1.00			0.55	1.00			1.00	1.00	
Satd. Flow (perm)		1432	1583			1021	3486			3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	10	70	0	0	90	676	75	0	338	30	
RTOR Reduction (vph)	0	0	53	0	0	0	10	0	0	0	12	
Lane Group Flow (vph)	0	26	17	0	0	90	741	0	0	338	18	
Turn Type	custom		custom			Perm					Perm	
Protected Phases			4				2			6		
Permitted Phases	4	4				2					6	
Actuated Green, G (s)		13.6	13.6			33.6	33.6			33.6	33.6	
Effective Green, g (s)		13.6	13.6			33.6	33.6			33.6	33.6	
Actuated g/C Ratio		0.24	0.24			0.60	0.60			0.60	0.60	
Clearance Time (s)		4.5	4.5			4.5	4.5			4.5	4.5	
Vehicle Extension (s)		0.2	0.2			0.2	0.2			0.2	0.2	
Lane Grp Cap (vph)		347	383			610	2084			2116	946	
v/s Ratio Prot			0.01				c0.21			0.10		
v/s Ratio Perm		c0.02				0.09					0.01	
v/c Ratio		0.07	0.04			0.15	0.36			0.16	0.02	
Uniform Delay, d1		16.4	16.3			5.0	5.8			5.0	4.6	
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	
Incremental Delay, d2		0.0	0.0			0.0	0.0			0.0	0.0	
Delay (s)		16.5	16.3			5.0	5.8			5.0	4.6	
Level of Service		B	B			A	A			A	A	
Approach Delay (s)		16.4		0.0			5.7			5.0		
Approach LOS		B		A			A			A		
Intersection Summary												
HCM Average Control Delay			6.3			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			56.2			Sum of lost time (s)				9.0		
Intersection Capacity Utilization			75.4%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: Broadway St & Fresno St













4/25/2011

											
Movement	WBL2	WBL	WBR	NBL	NBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations											
Volume (vph)	360	39	244	0	0	33	362	405	0	583	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	15	15	12	12	15	15	12	12
Total Lost time (s)		4.5	4.5			4.5	4.5			4.5	4.5
Lane Util. Factor		1.00	1.00			1.00	0.95			0.95	1.00
Frt		1.00	0.85			1.00	0.92			1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)		1947	1583			1770	3259			3539	1583
Flt Permitted		0.73	1.00			0.36	1.00			1.00	1.00
Satd. Flow (perm)		1503	1583			671	3259			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	42	265	0	0	36	393	440	0	634	46
RTOR Reduction (vph)	0	0	93	0	0	0	249	0	0	0	26
Lane Group Flow (vph)	0	433	172	0	0	36	584	0	0	634	20
Turn Type	custom		custom			Perm					Perm
Protected Phases			4				2			6	
Permitted Phases	4	4				2					6
Actuated Green, G (s)		25.0	25.0			26.0	26.0			26.0	26.0
Effective Green, g (s)		25.0	25.0			26.0	26.0			26.0	26.0
Actuated g/C Ratio		0.42	0.42			0.43	0.43			0.43	0.43
Clearance Time (s)		4.5	4.5			4.5	4.5			4.5	4.5
Vehicle Extension (s)		0.2	0.2			0.2	0.2			0.2	0.2
Lane Grp Cap (vph)		626	660			291	1412			1534	686
v/s Ratio Prot			0.11				0.18			0.18	
v/s Ratio Perm		0.29				0.05					0.01
v/c Ratio		0.69	0.26			0.12	0.41			0.41	0.03
Uniform Delay, d1		14.3	11.5			10.2	11.7			11.7	9.8
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00
Incremental Delay, d2		2.7	0.1			0.1	0.1			0.1	0.0
Delay (s)		17.0	11.5			10.2	11.8			11.8	9.8
Level of Service		B	B			B	B			B	A
Approach Delay (s)		14.9		0.0			11.7			11.7	
Approach LOS		B		A			B			B	
Intersection Summary											
HCM Average Control Delay			12.7			HCM Level of Service				B	
HCM Volume to Capacity ratio			0.55								
Actuated Cycle Length (s)			60.0			Sum of lost time (s)				9.0	
Intersection Capacity Utilization			57.0%			ICU Level of Service				B	
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

48: E St & Tuolumne St













4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑			↑↑			↑↑				
Volume (vph)	31	100	0	0	292	398	180	812	575	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.91			0.94				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3498			3233			4778				
Flt Permitted		0.77			1.00			0.99				
Satd. Flow (perm)		2739			3233			4778				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	109	0	0	317	433	196	883	625	0	0	0
RTOR Reduction (vph)	0	0	0	0	59	0	0	193	0	0	0	0
Lane Group Flow (vph)	0	143	0	0	691	0	0	1511	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		8			4		2	2				
Permitted Phases	8											
Actuated Green, G (s)		19.0			19.0			25.2				
Effective Green, g (s)		19.0			19.0			25.2				
Actuated g/C Ratio		0.35			0.35			0.46				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		960			1133			2222				
v/s Ratio Prot					c0.21			c0.32				
v/s Ratio Perm		0.05										
v/c Ratio		0.15			0.61			0.68				
Uniform Delay, d1		12.1			14.5			11.3				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.0			0.6			0.7				
Delay (s)		12.1			15.2			12.0				
Level of Service		B			B			B				
Approach Delay (s)		12.1			15.2			12.0			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			12.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			54.2			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			66.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: E St & Tuolumne St





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑			↑↑			↑↑↑				
Volume (vph)	32	156	0	0	184	321	99	646	531	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.90			0.94				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		3509			3202			4749				
Flt Permitted		0.83			1.00			1.00				
Satd. Flow (perm)		2939			3202			4749				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	170	0	0	200	349	108	702	577	0	0	0
RTOR Reduction (vph)	0	0	0	0	100	0	0	237	0	0	0	0
Lane Group Flow (vph)	0	205	0	0	449	0	0	1150	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		8			4		2	2				
Permitted Phases	8											
Actuated Green, G (s)		19.0			19.0			25.0				
Effective Green, g (s)		19.0			19.0			25.0				
Actuated g/C Ratio		0.35			0.35			0.46				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		1034			1127			2199				
v/s Ratio Prot					c0.14			c0.24				
v/s Ratio Perm		0.07										
v/c Ratio		0.20			0.40			0.52				
Uniform Delay, d1		12.2			13.2			10.3				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.0			0.1			0.1				
Delay (s)		12.2			13.3			10.4				
Level of Service		B			B			B				
Approach Delay (s)		12.2			13.3			10.4			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			11.3			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			54.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			61.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: Broadway St &





















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  				
Volume (vph)	108	181	0	0	76	71	52	493	708	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Lane Util. Factor	0.95	0.95			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1681	1765			1863	1583		5061	1583			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1681	1765			1863	1583		5061	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	197	0	0	83	77	57	536	770	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	68	0	0	411	0	0	0
Lane Group Flow (vph)	105	209	0	0	83	9	0	593	359	0	0	0
Turn Type	Split					Perm	Split		Perm			
Protected Phases	2	2			1		8	8				
Permitted Phases						1			8			
Actuated Green, G (s)	9.2	9.2			5.6	5.6		22.0	22.0			
Effective Green, g (s)	9.2	9.2			5.6	5.6		22.0	22.0			
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.44	0.44			
Clearance Time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Vehicle Extension (s)	3.8	3.8			2.0	2.0		2.0	2.0			
Lane Grp Cap (vph)	311	326			209	178		2236	699			
v/s Ratio Prot	0.06	c0.12			c0.04			0.12				
v/s Ratio Perm						0.01			c0.23			
v/c Ratio	0.34	0.64			0.40	0.05		0.27	0.51			
Uniform Delay, d1	17.7	18.8			20.5	19.7		8.8	10.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.8	4.6			0.5	0.0		0.0	0.3			
Delay (s)	18.5	23.4			21.0	19.8		8.8	10.3			
Level of Service	B	C			C	B		A	B			
Approach Delay (s)		21.8			20.4			9.7			0.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM Average Control Delay			12.7									
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			49.8									
Intersection Capacity Utilization			90.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: Broadway St &

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations								  				
Volume (vph)	65	94	0	0	436	100	242	768	296	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Lane Util. Factor	0.95	0.95			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1681	1764			1863	1583		5025	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	1681	1764			1863	1583		5025	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	102	0	0	474	109	263	835	322	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	213	0	0	0
Lane Group Flow (vph)	64	109	0	0	474	32	0	1098	109	0	0	0
Turn Type	Split					Perm	Split		Perm			
Protected Phases	2	2			1		8	8				
Permitted Phases						1			8			
Actuated Green, G (s)	7.9	7.9			17.0	17.0		19.3	19.3			
Effective Green, g (s)	7.9	7.9			17.0	17.0		19.3	19.3			
Actuated g/C Ratio	0.14	0.14			0.30	0.30		0.34	0.34			
Clearance Time (s)	4.6	4.6			4.2	4.2		4.2	4.2			
Vehicle Extension (s)	3.8	3.8			2.0	2.0		2.0	2.0			
Lane Grp Cap (vph)	232	244			554	470		1695	534			
v/s Ratio Prot	0.04	c0.06			c0.25			c0.22				
v/s Ratio Perm						0.02			0.07			
v/c Ratio	0.28	0.45			0.86	0.07		0.65	0.20			
Uniform Delay, d1	22.1	22.6			18.9	14.4		16.1	13.5			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.8	1.7			11.9	0.0		0.6	0.1			
Delay (s)	22.9	24.3			30.8	14.4		16.7	13.6			
Level of Service	C	C			C	B		B	B			
Approach Delay (s)		23.8			27.8			16.0			0.0	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM Average Control Delay			19.8				HCM Level of Service		B			
HCM Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			57.2				Sum of lost time (s)		13.0			
Intersection Capacity Utilization			92.5%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Van Ness Ave & Tuolumne St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	86	367	0	0	273	67	42	665	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2			4.2				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1770	1863			1813			4978				
Flt Permitted	0.47	1.00			1.00			1.00				
Satd. Flow (perm)	871	1863			1813			4978				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	399	0	0	297	73	46	723	109	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	30	0	0	0	0
Lane Group Flow (vph)	93	399	0	0	355	0	0	848	0	0	0	0
Turn Type	Perm				Split							
Protected Phases		2			6			8	8			
Permitted Phases	2											
Actuated Green, G (s)	27.0	27.0			27.0			22.0				
Effective Green, g (s)	27.0	27.0			27.0			22.0				
Actuated g/C Ratio	0.47	0.47			0.47			0.38				
Clearance Time (s)	4.2	4.2			4.2			4.2				
Vehicle Extension (s)	0.2	0.2			0.2			0.2				
Lane Grp Cap (vph)	410	876			853			1908				
v/s Ratio Prot		c0.21			0.20			c0.17				
v/s Ratio Perm	0.11											
v/c Ratio	0.23	0.46			0.42			0.44				
Uniform Delay, d1	9.0	10.2			10.0			13.2				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	0.1	0.1			0.1			0.1				
Delay (s)	9.1	10.4			10.1			13.2				
Level of Service	A	B			B			B				
Approach Delay (s)		10.1			10.1			13.2			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			11.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			57.4			Sum of lost time (s)			8.4			
Intersection Capacity Utilization			75.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Van Ness Ave & Tuolumne St









4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	38	323	0	0	609	115	46	612	133	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2			4.2				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.97				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1770	1863			1823			4942				
Flt Permitted	0.14	1.00			1.00			1.00				
Satd. Flow (perm)	261	1863			1823			4942				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	351	0	0	662	125	50	665	145	0	0	0
RTOR Reduction (vph)	0	0	0	0	11	0	0	51	0	0	0	0
Lane Group Flow (vph)	41	351	0	0	776	0	0	809	0	0	0	0
Turn Type	Perm				Split							
Protected Phases		2			6			8	8			
Permitted Phases	2											
Actuated Green, G (s)	28.5	28.5			28.5			22.0				
Effective Green, g (s)	28.5	28.5			28.5			22.0				
Actuated g/C Ratio	0.48	0.48			0.48			0.37				
Clearance Time (s)	4.2	4.2			4.2			4.2				
Vehicle Extension (s)	0.2	0.2			0.2			0.2				
Lane Grp Cap (vph)	126	901			882			1846				
v/s Ratio Prot		0.19			c0.43			c0.16				
v/s Ratio Perm	0.16											
v/c Ratio	0.33	0.39			0.88			0.44				
Uniform Delay, d1	9.3	9.7			13.7			13.8				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	0.6	0.1			9.7			0.1				
Delay (s)	9.9	9.8			23.3			13.9				
Level of Service	A	A			C			B				
Approach Delay (s)		9.8			23.3			13.9			0.0	
Approach LOS		A			C			B			A	
Intersection Summary												
HCM Average Control Delay			16.7		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			58.9		Sum of lost time (s)				8.4			
Intersection Capacity Utilization			91.2%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

51: O St & Tuolumne St









4/25/2011

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	0	60	317	306	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2			
Lane Util. Factor		1.00	0.91			
Frt		0.86	0.93			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1611	4711			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1611	4711			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	65	345	333	0	0
RTOR Reduction (vph)	0	58	142	0	0	0
Lane Group Flow (vph)	0	7	536	0	0	0
Turn Type	custom					
Protected Phases	8					
Permitted Phases	2					
Actuated Green, G (s)	2.8 15.0					
Effective Green, g (s)	2.8 15.0					
Actuated g/C Ratio	0.11 0.57					
Clearance Time (s)	4.2 4.2					
Vehicle Extension (s)	0.2 6.0					
Lane Grp Cap (vph)	172 2697					
v/s Ratio Prot	c0.11					
v/s Ratio Perm	c0.00					
v/c Ratio	0.04 0.20					
Uniform Delay, d1	10.5 2.7					
Progression Factor	1.00 1.00					
Incremental Delay, d2	0.0 0.1					
Delay (s)	10.5 2.8					
Level of Service	B A					
Approach Delay (s)	10.5		2.8			0.0
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			3.5	HCM Level of Service		A
HCM Volume to Capacity ratio			0.17			
Actuated Cycle Length (s)			26.2	Sum of lost time (s)		8.4
Intersection Capacity Utilization			23.7%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

51: O St & Tuolumne St

















4/25/2011

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	0	266	586	267	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2			
Lane Util. Factor		1.00	0.91			
Frt		0.86	0.95			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1611	4847			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1611	4847			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	289	637	290	0	0
RTOR Reduction (vph)	0	95	121	0	0	0
Lane Group Flow (vph)	0	194	806	0	0	0
Turn Type	custom					
Protected Phases			8			
Permitted Phases		2				
Actuated Green, G (s)		6.6	17.9			
Effective Green, g (s)		6.6	17.9			
Actuated g/C Ratio		0.20	0.54			
Clearance Time (s)		4.2	4.2			
Vehicle Extension (s)		0.2	6.0			
Lane Grp Cap (vph)		323	2637			
v/s Ratio Prot			c0.17			
v/s Ratio Perm		c0.12				
v/c Ratio		0.60	0.31			
Uniform Delay, d1		12.0	4.1			
Progression Factor		1.00	1.00			
Incremental Delay, d2		2.1	0.2			
Delay (s)		14.1	4.3			
Level of Service		B	A			
Approach Delay (s)	14.1		4.3			0.0
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay			6.6	HCM Level of Service		A
HCM Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			32.9	Sum of lost time (s)		8.4
Intersection Capacity Utilization			40.8%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

52: E St & Stanislaus St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	117	124	90	262	0	0	0	0	25	904	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4			5.4						5.4	5.4
Lane Util. Factor		0.95			0.95						0.91	1.00
Frt		0.92			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		3266			3495						5079	1583
Flt Permitted		1.00			0.81						1.00	1.00
Satd. Flow (perm)		3266			2878						5079	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	127	135	98	285	0	0	0	0	27	983	86
RTOR Reduction (vph)	0	87	0	0	0	0	0	0	0	0	0	56
Lane Group Flow (vph)	0	175	0	0	383	0	0	0	0	0	1010	30
Turn Type				Perm						Split		Perm
Protected Phases		2			2					8	8	
Permitted Phases				2								8
Actuated Green, G (s)		6.7			6.7						9.6	9.6
Effective Green, g (s)		6.7			6.7						9.6	9.6
Actuated g/C Ratio		0.25			0.25						0.35	0.35
Clearance Time (s)		5.4			5.4						5.4	5.4
Vehicle Extension (s)		0.2			0.2						0.2	0.2
Lane Grp Cap (vph)		807			712						1799	561
v/s Ratio Prot		0.05									c0.20	
v/s Ratio Perm					c0.13							0.02
v/c Ratio		0.22			0.54						0.56	0.05
Uniform Delay, d1		8.1			8.9						7.1	5.8
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		0.0			0.4						0.2	0.0
Delay (s)		8.2			9.2						7.3	5.8
Level of Service		A			A						A	A
Approach Delay (s)		8.2			9.2			0.0			7.2	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			7.8			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			27.1			Sum of lost time (s)				10.8		
Intersection Capacity Utilization			48.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

52: E St & Stanislaus St

4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	141	337	108	159	0	0	0	0	60	2252	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4			5.4						5.4	5.4
Lane Util. Factor		0.95			0.95						0.91	1.00
Frt		0.89			1.00						1.00	0.85
Flt Protected		1.00			0.98						1.00	1.00
Satd. Flow (prot)		3165			3469						5079	1583
Flt Permitted		1.00			0.62						1.00	1.00
Satd. Flow (perm)		3165			2205						5079	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	153	366	117	173	0	0	0	0	65	2448	107
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	517	0	0	290	0	0	0	0	0	2513	62
Turn Type				Perm						Split		Perm
Protected Phases		2			2					8	8	
Permitted Phases				2								8
Actuated Green, G (s)		12.5			12.5						32.7	32.7
Effective Green, g (s)		12.5			12.5						32.7	32.7
Actuated g/C Ratio		0.22			0.22						0.58	0.58
Clearance Time (s)		5.4			5.4						5.4	5.4
Vehicle Extension (s)		0.2			0.2						0.2	0.2
Lane Grp Cap (vph)		706			492						2966	924
v/s Ratio Prot		c0.16									c0.49	
v/s Ratio Perm					0.13							0.04
v/c Ratio		1.02dr			0.59						0.85	0.07
Uniform Delay, d1		20.2			19.5						9.6	5.0
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		3.4			1.2						2.3	0.0
Delay (s)		23.6			20.6						11.9	5.1
Level of Service		C			C						B	A
Approach Delay (s)		23.6			20.6			0.0			11.6	
Approach LOS		C			C			A			B	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		



















dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

53: Broadway St & Stanislaus St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	137	496	10	159	0	0	0	0	115	634	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Lane Util. Factor		0.95		1.00	1.00					1.00	0.95	1.00
Frt		0.88		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3123		1770	1863					1770	3539	1583
Flt Permitted		1.00		0.27	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3123		508	1863					1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	149	539	11	173	0	0	0	0	125	689	17
RTOR Reduction (vph)	0	128	0	0	0	0	0	0	0	0	0	8
Lane Group Flow (vph)	0	560	0	11	173	0	0	0	0	125	689	9
Turn Type				Perm						Split		Perm
Protected Phases		2			2					4	4	
Permitted Phases				2								4
Actuated Green, G (s)		19.0		19.0	19.0					31.0	31.0	31.0
Effective Green, g (s)		19.0		19.0	19.0					31.0	31.0	31.0
Actuated g/C Ratio		0.33		0.33	0.33					0.53	0.53	0.53
Clearance Time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Vehicle Extension (s)		0.2		0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1016		165	606					940	1879	840
v/s Ratio Prot		c0.18			0.09					0.07	c0.19	
v/s Ratio Perm				0.02								0.01
v/c Ratio		0.55		0.07	0.29					0.13	0.37	0.01
Uniform Delay, d1		16.2		13.6	14.7					6.9	8.0	6.5
Progression Factor		1.00		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.4		0.1	0.1					0.0	0.0	0.0
Delay (s)		16.6		13.6	14.7					6.9	8.0	6.5
Level of Service		B		B	B					A	A	A
Approach Delay (s)		16.6			14.7			0.0			7.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			12.1		HCM Level of Service					B		
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			58.4		Sum of lost time (s)					8.4		
Intersection Capacity Utilization			90.7%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

53: Broadway St & Stanislaus St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	112	380	188	418	0	0	0	0	40	1396	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Lane Util. Factor		0.95		1.00	1.00					1.00	0.95	1.00
Frt		0.88		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3129		1770	1863					1770	3539	1583
Flt Permitted		1.00		0.38	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3129		713	1863					1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	122	413	204	454	0	0	0	0	43	1517	372
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	92
Lane Group Flow (vph)	0	522	0	204	454	0	0	0	0	43	1517	280
Turn Type				Perm						Split		Perm
Protected Phases		2			2					4	4	
Permitted Phases				2								4
Actuated Green, G (s)		20.0		20.0	20.0					31.0	31.0	31.0
Effective Green, g (s)		20.0		20.0	20.0					31.0	31.0	31.0
Actuated g/C Ratio		0.34		0.34	0.34					0.52	0.52	0.52
Clearance Time (s)		4.2		4.2	4.2					4.2	4.2	4.2
Vehicle Extension (s)		0.2		0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1054		240	627					924	1847	826
v/s Ratio Prot		0.17			0.24					0.02	0.43	
v/s Ratio Perm				0.29								0.18
v/c Ratio		0.50		0.85	0.72					0.05	0.82	0.34
Uniform Delay, d1		15.7		18.3	17.3					7.0	11.9	8.2
Progression Factor		1.00		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1		22.7	3.5					0.0	2.9	0.1
Delay (s)		15.8		41.0	20.8					7.0	14.8	8.3
Level of Service		B		D	C					A	B	A
Approach Delay (s)		15.8			27.0			0.0			13.4	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM Average Control Delay			16.7			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			59.4			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			92.5%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

54: Van Ness Ave & Stanislaus St



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	269	15	75	238	0	0	0	0	171	633	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2						4.2	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frt		0.99		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1850		1770	1863						4996	
Flt Permitted		1.00		0.53	1.00						0.99	
Satd. Flow (perm)		1850		992	1863						4996	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	292	16	82	259	0	0	0	0	186	688	47
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	305	0	82	259	0	0	0	0	0	912	0
Turn Type				Perm						Split		
Protected Phases		2			6					4	4	
Permitted Phases				6								
Actuated Green, G (s)		29.6		29.6	29.6						22.0	
Effective Green, g (s)		29.6		29.6	29.6						22.0	
Actuated g/C Ratio		0.49		0.49	0.49						0.37	
Clearance Time (s)		4.2		4.2	4.2						4.2	
Vehicle Extension (s)		0.2		0.2	0.2						0.2	
Lane Grp Cap (vph)		913		489	919						1832	
v/s Ratio Prot		c0.16			0.14						c0.18	
v/s Ratio Perm				0.08								
v/c Ratio		0.33		0.17	0.28						0.50	
Uniform Delay, d1		9.2		8.4	8.9						14.7	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		1.0		0.1	0.1						0.1	
Delay (s)		10.2		8.5	9.0						14.8	
Level of Service		B		A	A						B	
Approach Delay (s)		10.2			8.9			0.0			14.8	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM Average Control Delay			12.6		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)				8.4			
Intersection Capacity Utilization			75.5%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

54: Van Ness Ave & Stanislaus St















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											  	
Volume (vph)	0	220	27	209	426	0	0	0	0	122	1539	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		4.2	4.2						4.2	
Lane Util. Factor		1.00		1.00	1.00						0.91	
Frt		0.99		1.00	1.00						0.99	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1836		1770	1863						5031	
Flt Permitted		1.00		0.57	1.00						1.00	
Satd. Flow (perm)		1836		1053	1863						5031	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	239	29	227	463	0	0	0	0	133	1673	90
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	266	0	227	463	0	0	0	0	0	1887	0
Turn Type				Perm							Split	
Protected Phases		2			6						4	4
Permitted Phases				6								
Actuated Green, G (s)		28.2		28.2	28.2						23.4	
Effective Green, g (s)		28.2		28.2	28.2						23.4	
Actuated g/C Ratio		0.47		0.47	0.47						0.39	
Clearance Time (s)		4.2		4.2	4.2						4.2	
Vehicle Extension (s)		0.2		0.2	0.2						0.2	
Lane Grp Cap (vph)		863		495	876						1962	
v/s Ratio Prot		0.15			c0.25						c0.38	
v/s Ratio Perm				0.22								
v/c Ratio		0.31		0.46	0.53						0.96	
Uniform Delay, d1		9.9		10.7	11.2						17.9	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		0.9		0.2	0.3						12.4	
Delay (s)		10.8		11.0	11.5						30.3	
Level of Service		B		B	B						C	
Approach Delay (s)		10.8			11.3			0.0			30.3	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM Average Control Delay			23.9			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)				8.4		
Intersection Capacity Utilization			91.2%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

55: N Blackstone Ave & Parking Lot















4/25/2011

								
Movement	SBL	SBR	SBR2	SER	NWL	NWT	SWL	SWT
Lane Configurations								
Volume (vph)	294	1019	3	40	23	47	97	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12
Total Lost time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Lane Util. Factor	1.00	0.88		1.00		1.00	1.00	0.95
Frt	1.00	0.85		0.86		1.00	1.00	1.00
Flt Protected	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (prot)	1770	2787		1611		1833	1770	3539
Flt Permitted	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (perm)	1770	2787		1611		1833	1770	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	1108	3	43	25	51	105	111
RTOR Reduction (vph)	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	320	1111	0	2	0	76	105	111
Turn Type		Prot		custom		Split		Split
Protected Phases	2	2		8	1	1	4	4
Permitted Phases								
Actuated Green, G (s)	36.8	36.8		3.3		12.2	12.9	12.9
Effective Green, g (s)	36.8	36.8		3.3		12.2	12.9	12.9
Actuated g/C Ratio	0.44	0.44		0.04		0.15	0.16	0.16
Clearance Time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Vehicle Extension (s)	4.0	4.0		2.0		2.0	4.0	4.0
Lane Grp Cap (vph)	786	1237		64		270	275	551
v/s Ratio Prot	0.18	c0.40		c0.00		c0.04	c0.06	0.03
v/s Ratio Perm								
v/c Ratio	0.41	0.90		0.03		0.28	0.38	0.20
Uniform Delay, d1	15.6	21.3		38.3		31.5	31.4	30.5
Progression Factor	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	9.1		0.1		0.2	1.2	0.2
Delay (s)	16.1	30.4		38.3		31.7	32.6	30.8
Level of Service	B	C		D		C	C	C
Approach Delay (s)	27.2					31.7		31.7
Approach LOS	C					C		C
Intersection Summary								
HCM Average Control Delay			28.2		HCM Level of Service			C
HCM Volume to Capacity ratio			0.64					
Actuated Cycle Length (s)			82.9		Sum of lost time (s)			17.7
Intersection Capacity Utilization			75.5%		ICU Level of Service			D
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

55: N Blackstone Ave & Parking Lot



















4/25/2011

								
Movement	SBL	SBR	SBR2	SER	NWL	NWT	SWL	SWT
Lane Configurations								
Volume (vph)	452	1307	5	67	15	26	114	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12
Total Lost time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Lane Util. Factor	1.00	0.88		1.00		1.00	1.00	0.95
Frt	1.00	0.85		0.86		1.00	1.00	1.00
Flt Protected	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (prot)	1770	2787		1611		1829	1770	3539
Flt Permitted	0.95	1.00		1.00		0.98	0.95	1.00
Satd. Flow (perm)	1770	2787		1611		1829	1770	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	491	1421	5	73	16	28	124	208
RTOR Reduction (vph)	0	0	0	69	0	0	0	0
Lane Group Flow (vph)	491	1426	0	4	0	44	124	208
Turn Type		Prot		custom	Split		Split	
Protected Phases	2	2		8	1	1	4	4
Permitted Phases								
Actuated Green, G (s)	49.4	49.4		4.7		12.0	13.4	13.4
Effective Green, g (s)	49.4	49.4		4.7		12.0	13.4	13.4
Actuated g/C Ratio	0.51	0.51		0.05		0.12	0.14	0.14
Clearance Time (s)	4.9	4.9		4.2		4.0	4.6	4.6
Vehicle Extension (s)	4.0	4.0		2.0		2.0	4.0	4.0
Lane Grp Cap (vph)	900	1416		78		226	244	488
v/s Ratio Prot	0.28	c0.51		c0.00		c0.02	c0.07	0.06
v/s Ratio Perm								
v/c Ratio	0.55	1.01		0.05		0.19	0.51	0.43
Uniform Delay, d1	16.3	23.9		44.1		38.3	38.8	38.4
Progression Factor	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	25.6		0.1		0.2	2.3	0.8
Delay (s)	17.1	49.5		44.2		38.4	41.1	39.2
Level of Service	B	D		D		D	D	D
Approach Delay (s)	41.2					38.4		39.9
Approach LOS	D					D		D
Intersection Summary								
HCM Average Control Delay			41.1		HCM Level of Service			D
HCM Volume to Capacity ratio			0.74					
Actuated Cycle Length (s)			97.2		Sum of lost time (s)			17.7
Intersection Capacity Utilization			85.6%		ICU Level of Service			E
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

56: E Divisadero St & N Abby St



















4/25/2011

											
Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NWL2	NWL	NWR	NWR2	
Lane Configurations											
Volume (vph)	135	375	21	72	94	50	225	74	473	22	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2	5.2		
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.76		
Frt	1.00	0.99		1.00	0.95			1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		
Satd. Flow (prot)	1770	3511		1770	3355			1770	3610		
Flt Permitted	0.65	1.00		0.50	1.00			0.95	1.00		
Satd. Flow (perm)	1217	3511		933	3355			1770	3610		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	147	408	23	78	102	54	245	80	514	24	
RTOR Reduction (vph)	0	7	0	0	32	0	0	0	7	0	
Lane Group Flow (vph)	147	424	0	78	124	0	0	325	531	0	
Turn Type	Perm			Perm			Split			Perm	
Protected Phases		4			4		2	2			
Permitted Phases	4			4					2		
Actuated Green, G (s)	23.0	23.0		23.0	23.0			23.0	23.0		
Effective Green, g (s)	23.0	23.0		23.0	23.0			23.0	23.0		
Actuated g/C Ratio	0.41	0.41		0.41	0.41			0.41	0.41		
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2	5.2		
Vehicle Extension (s)	0.2	0.2		0.2	0.2			0.2	0.2		
Lane Grp Cap (vph)	496	1432		380	1368			722	1472		
v/s Ratio Prot		c0.12			0.04			c0.18			
v/s Ratio Perm	0.12			0.08					0.15		
v/c Ratio	0.30	0.30		0.21	0.09			0.45	0.36		
Uniform Delay, d1	11.2	11.2		10.8	10.3			12.1	11.6		
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		
Incremental Delay, d2	0.1	0.0		0.1	0.0			0.2	0.1		
Delay (s)	11.4	11.3		10.9	10.3			12.3	11.7		
Level of Service	B	B		B	B			B	B		
Approach Delay (s)		11.3			10.5			11.9			
Approach LOS		B			B			B			
Intersection Summary											
HCM Average Control Delay			11.5			HCM Level of Service			B		
HCM Volume to Capacity ratio			0.37								
Actuated Cycle Length (s)			56.4			Sum of lost time (s)			10.4		
Intersection Capacity Utilization			70.5%			ICU Level of Service			C		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

56: E Divisadero St & N Abby St


















4/25/2011

											
Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NWL2	NWL	NWR	NWR2	
Lane Configurations											
Volume (vph)	262	296	8	113	263	182	237	266	1577	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2	5.2		
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.76		
Frt	1.00	1.00		1.00	0.94			1.00	0.85		
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		
Satd. Flow (prot)	1770	3525		1770	3322			1770	3610		
Flt Permitted	0.43	1.00		0.55	1.00			0.95	1.00		
Satd. Flow (perm)	810	3525		1028	3322			1770	3610		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	285	322	9	123	286	198	258	289	1714	32	
RTOR Reduction (vph)	0	3	0	0	6	0	0	46	2	0	
Lane Group Flow (vph)	285	328	0	123	478	0	0	501	1744	0	
Turn Type	Perm			Perm			Split		Perm		
Protected Phases		4			4		2	2			
Permitted Phases	4			4					2		
Actuated Green, G (s)	24.8	24.8		24.8	24.8			34.1	34.1		
Effective Green, g (s)	24.8	24.8		24.8	24.8			34.1	34.1		
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.49	0.49		
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2	5.2		
Vehicle Extension (s)	0.2	0.2		0.2	0.2			0.2	0.2		
Lane Grp Cap (vph)	290	1261		368	1189			871	1776		
v/s Ratio Prot		0.09			0.14			0.28			
v/s Ratio Perm	c0.35			0.12					c0.48		
v/c Ratio	0.98	0.26		0.33	0.40			0.57	0.98		
Uniform Delay, d1	22.0	15.8		16.2	16.7			12.5	17.3		
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		
Incremental Delay, d2	47.7	0.0		0.2	0.1			0.6	17.1		
Delay (s)	69.7	15.8		16.4	16.8			13.0	34.4		
Level of Service	E	B		B	B			B	C		
Approach Delay (s)		40.8			16.7			29.3			
Approach LOS		D			B			C			
Intersection Summary											
HCM Average Control Delay			29.1			HCM Level of Service			C		
HCM Volume to Capacity ratio			0.98								
Actuated Cycle Length (s)			69.3			Sum of lost time (s)			10.4		
Intersection Capacity Utilization			88.8%			ICU Level of Service			E		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

57: E Divisadero St & N Blackstone Ave




























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	425	40	0	328	0	0	0	0	105	1274	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5					4.9	4.9	4.9
Lane Util. Factor		0.95			0.95					1.00	0.95	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3494			3539					1770	3539	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3494			3539					1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	462	43	0	357	0	0	0	0	114	1385	187
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	55
Lane Group Flow (vph)	0	496	0	0	357	0	0	0	0	114	1385	132
Turn Type										Split		Perm
Protected Phases		4			4					2	2	
Permitted Phases												2
Actuated Green, G (s)		27.0			27.0					28.6	28.6	28.6
Effective Green, g (s)		27.0			27.0					28.6	28.6	28.6
Actuated g/C Ratio		0.42			0.42					0.44	0.44	0.44
Clearance Time (s)		4.5			4.5					4.9	4.9	4.9
Vehicle Extension (s)		5.0			5.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1451			1470					779	1557	697
v/s Ratio Prot		c0.14			0.10					0.06	c0.39	
v/s Ratio Perm												0.08
v/c Ratio		0.34			0.24					0.15	0.89	0.19
Uniform Delay, d1		12.9			12.4					10.9	16.7	11.1
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.3			0.2					0.2	7.1	0.3
Delay (s)		13.2			12.5					11.1	23.9	11.4
Level of Service		B			B					B	C	B
Approach Delay (s)		13.2			12.5			0.0			21.6	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM Average Control Delay			18.7			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)				9.4		
Intersection Capacity Utilization			65.6%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

57: E Divisadero St & N Blackstone Ave










4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  					  	  	  
Volume (vph)	0	440	74	0	1089	0	0	0	0	119	1684	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5					4.9	4.9	4.9
Lane Util. Factor		0.95			0.95					1.00	0.95	1.00
Frt		0.98			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		3463			3539					1770	3539	1583
Flt Permitted		1.00			1.00					0.95	1.00	1.00
Satd. Flow (perm)		3463			3539					1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	478	80	0	1184	0	0	0	0	129	1830	324
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	0	551	0	0	1184	0	0	0	0	129	1830	319
Turn Type										Split		Perm
Protected Phases		4			4					2	2	
Permitted Phases												2
Actuated Green, G (s)		27.8			27.8					42.8	42.8	42.8
Effective Green, g (s)		27.8			27.8					42.8	42.8	42.8
Actuated g/C Ratio		0.35			0.35					0.53	0.53	0.53
Clearance Time (s)		4.5			4.5					4.9	4.9	4.9
Vehicle Extension (s)		5.0			5.0					5.0	5.0	5.0
Lane Grp Cap (vph)		1203			1230					947	1893	847
v/s Ratio Prot		0.16			0.33					0.07	0.52	
v/s Ratio Perm												0.20
v/c Ratio		0.46			0.96					0.14	0.97	0.38
Uniform Delay, d1		20.3			25.6					9.3	17.9	10.8
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.6			17.6					0.1	13.8	0.6
Delay (s)		20.8			43.2					9.5	31.7	11.4
Level of Service		C			D					A	C	B
Approach Delay (s)		20.8			43.2			0.0			27.6	
Approach LOS		C			D			A			C	
Intersection Summary												
HCM Average Control Delay			31.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)				9.4		
Intersection Capacity Utilization			84.5%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

58: H St & San Joaquin St










4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	6	703	346	10	9	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	764	376	11	10	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	387				1159	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387				1159	382
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				95	99
cM capacity (veh/h)	1172				215	666
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	771	387	17			
Volume Left	7	0	10			
Volume Right	0	11	8			
cSH	1172	1700	306			
Volume to Capacity	0.01	0.23	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.1	0.0	17.5			
Lane LOS	A		C			
Approach Delay (s)	0.1	0.0	17.5			
Approach LOS			C			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			51.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

58: H St & San Joaquin St




















4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	5	777	590	4	4	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	845	641	4	4	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	646				1499	643
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	646				1499	643
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	100
cM capacity (veh/h)	940				134	473
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	850	646	7			
Volume Left	5	0	4			
Volume Right	0	4	2			
cSH	940	1700	176			
Volume to Capacity	0.01	0.38	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.2	0.0	26.3			
Lane LOS	A		D			
Approach Delay (s)	0.2	0.0	26.3			
Approach LOS			D			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			54.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

59: E Divisadero St & N San Pablo Ave




















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	443	317	7	277	23	2	11	14	35	259	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.92		1.00	0.96	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3528	1583		3495		1770	1708		1770	1794	
Flt Permitted		0.92	1.00		0.94		0.38	1.00		0.74	1.00	
Satd. Flow (perm)		3243	1583		3300		710	1708		1378	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	482	345	8	301	25	2	12	15	38	282	92
RTOR Reduction (vph)	0	0	165	0	10	0	0	10	0	0	19	0
Lane Group Flow (vph)	0	516	180	0	324	0	2	17	0	38	355	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)		30.6	30.6		30.6		18.6	18.6		18.6	18.6	
Effective Green, g (s)		30.6	30.6		30.6		18.6	18.6		18.6	18.6	
Actuated g/C Ratio		0.51	0.51		0.51		0.31	0.31		0.31	0.31	
Clearance Time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1654	807		1683		220	529		427	556	
v/s Ratio Prot								0.01			c0.20	
v/s Ratio Perm		c0.16	0.11		0.10		0.00			0.03		
v/c Ratio		0.31	0.22		0.19		0.01	0.03		0.09	0.64	
Uniform Delay, d1		8.6	8.1		8.0		14.3	14.4		14.7	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.1		0.0		0.0	0.0		0.0	1.8	
Delay (s)		8.6	8.2		8.0		14.3	14.4		14.7	19.6	
Level of Service		A	A		A		B	B		B	B	
Approach Delay (s)		8.4			8.0			14.4			19.1	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			11.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			10.8			
Intersection Capacity Utilization			83.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

59: E Divisadero St & N San Pablo Ave

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	447	263	22	1018	203	18	32	22	55	304	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.98		1.00	0.94		1.00	0.95	
Flt Protected		0.99	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3490	1583		3449		1770	1749		1770	1771	
Flt Permitted		0.54	1.00		0.94		0.22	1.00		0.72	1.00	
Satd. Flow (perm)		1897	1583		3232		408	1749		1338	1771	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	486	286	24	1107	221	20	35	24	60	330	162
RTOR Reduction (vph)	0	0	134	0	27	0	0	17	0	0	30	0
Lane Group Flow (vph)	0	678	152	0	1325	0	20	42	0	60	462	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)		30.6	30.6		30.6		18.6	18.6		18.6	18.6	
Effective Green, g (s)		30.6	30.6		30.6		18.6	18.6		18.6	18.6	
Actuated g/C Ratio		0.51	0.51		0.51		0.31	0.31		0.31	0.31	
Clearance Time (s)		5.4	5.4		5.4		5.4	5.4		5.4	5.4	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		967	807		1648		126	542		415	549	
v/s Ratio Prot								0.02			c0.26	
v/s Ratio Perm		0.36	0.10		c0.41		0.05			0.04		
v/c Ratio		1.55dl	0.19		0.80		0.16	0.08		0.14	0.84	
Uniform Delay, d1		11.2	8.0		12.2		15.0	14.6		15.0	19.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		2.8		0.2	0.0		0.1	10.8	
Delay (s)		13.1	8.0		15.0		15.2	14.7		15.0	30.1	
Level of Service		B	A		B		B	B		B	C	
Approach Delay (s)		11.6			15.0			14.8			28.5	
Approach LOS		B			B			B			C	

Intersection Summary

HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		










dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

60: H St & Amador St










4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	49	666	338	17	43	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	724	367	18	47	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386				1207	377
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386				1207	377
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				76	91
cM capacity (veh/h)	1173				193	670
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	777	386	109			
Volume Left	53	0	47			
Volume Right	0	18	62			
cSH	1173	1700	325			
Volume to Capacity	0.05	0.23	0.33			
Queue Length 95th (ft)	4	0	36			
Control Delay (s)	1.2	0.0	21.5			
Lane LOS	A		C			
Approach Delay (s)	1.2	0.0	21.5			
Approach LOS			C			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			72.5%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

60: H St & Amador St






















4/25/2011

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	118	719	538	60	69	240
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	128	782	585	65	75	261
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	650				1655	617
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	650				1655	617
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				19	47
cM capacity (veh/h)	936				93	490
Direction, Lane #	SE 1	NW 1	SW 1			
Volume Total	910	650	336			
Volume Left	128	0	75			
Volume Right	0	65	261			
cSH	936	1700	251			
Volume to Capacity	0.14	0.38	1.34			
Queue Length 95th (ft)	12	0	443			
Control Delay (s)	3.4	0.0	215.7			
Lane LOS	A		F			
Approach Delay (s)	3.4	0.0	215.7			
Approach LOS			F			
Intersection Summary						
Average Delay			39.9			
Intersection Capacity Utilization			104.9%	ICU Level of Service		G
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

61: E Divisadero St & G St






















4/25/2011

												
Movement	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	55	120	36	596	600	168	5	173	205	270	125	323
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5		4.9	4.9		4.9	4.9	4.9	4.5	4.5	
Lane Util. Factor		0.97		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt		0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.85	
Flt Protected		0.96		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3381		1770	3423		1770	1863	1583	1770	1583	
Flt Permitted		0.62		0.64	1.00		0.30	1.00	1.00	0.61	1.00	
Satd. Flow (perm)		2171		1191	3423		556	1863	1583	1140	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	130	39	648	652	183	5	188	223	293	136	351
RTOR Reduction (vph)	0	28	0	0	40	0	0	0	97	0	143	0
Lane Group Flow (vph)	0	201	0	648	795	0	5	188	126	293	344	0
Turn Type	Perm			Perm			Perm		Perm		Over	
Protected Phases		4			2			2			4	
Permitted Phases	4			2			2		2	4		
Actuated Green, G (s)		18.8		36.6	36.6		36.6	36.6	36.6	18.8	18.8	
Effective Green, g (s)		18.8		36.6	36.6		36.6	36.6	36.6	18.8	18.8	
Actuated g/C Ratio		0.29		0.56	0.56		0.56	0.56	0.56	0.29	0.29	
Clearance Time (s)		4.5		4.9	4.9		4.9	4.9	4.9	4.5	4.5	
Vehicle Extension (s)		5.0		4.0	4.0		4.0	4.0	4.0	5.0	5.0	
Lane Grp Cap (vph)		630		673	1933		314	1052	894	331	459	
v/s Ratio Prot					0.23			0.10			0.22	
v/s Ratio Perm		0.09		c0.54			0.01		0.08	c0.26		
v/c Ratio		0.32		0.96	0.41		0.02	0.18	0.14	0.89	0.75	
Uniform Delay, d1		18.0		13.5	8.0		6.2	6.8	6.7	22.0	20.9	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6		25.8	0.2		0.0	0.1	0.1	24.8	7.9	
Delay (s)		18.6		39.2	8.2		6.2	6.9	6.8	46.8	28.7	
Level of Service		B		D	A		A	A	A	D	C	
Approach Delay (s)		18.6			21.7			6.8		35.5		
Approach LOS		B			C			A		D		
Intersection Summary												
HCM Average Control Delay			23.1			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			64.8			Sum of lost time (s)			9.4			
Intersection Capacity Utilization			85.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

61: E Divisadero St & G St

4/25/2011

												
Movement	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	90	117	33	394	606	86	21	806	449	410	79	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5		4.9	4.9		4.9	4.9	4.9	4.5	4.5	
Lane Util. Factor		0.97		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt		0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.85	
Flt Protected		0.96		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3393		1770	3474		1770	1863	1583	1770	1583	
Flt Permitted		0.57		0.18	1.00		0.33	1.00	1.00	0.54	1.00	
Satd. Flow (perm)		2033		327	3474		609	1863	1583	1006	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	127	36	428	659	93	23	876	488	446	86	865
RTOR Reduction (vph)	0	8	0	0	8	0	0	0	147	0	128	0
Lane Group Flow (vph)	0	253	0	428	744	0	23	876	341	446	823	0
Turn Type	Perm			Perm			Perm		Perm			Over
Protected Phases		4			2			2				4
Permitted Phases	4			2			2		2	4		
Actuated Green, G (s)		44.5		96.1	96.1		96.1	96.1	96.1	44.5	44.5	
Effective Green, g (s)		44.5		96.1	96.1		96.1	96.1	96.1	44.5	44.5	
Actuated g/C Ratio		0.30		0.64	0.64		0.64	0.64	0.64	0.30	0.30	
Clearance Time (s)		4.5		4.9	4.9		4.9	4.9	4.9	4.5	4.5	
Vehicle Extension (s)		5.0		4.0	4.0		4.0	4.0	4.0	5.0	5.0	
Lane Grp Cap (vph)		603		209	2226		390	1194	1014	298	470	
v/s Ratio Prot					0.21			0.47			c0.52	
v/s Ratio Perm		0.12		c1.31			0.04		0.22	0.44		
v/c Ratio		1.69dl		2.05	0.33		0.06	0.73	0.34	1.50	1.75	
Uniform Delay, d1		42.4		27.0	12.3		10.1	18.3	12.3	52.8	52.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.0		487.8	0.1		0.1	2.5	0.3	240.4	346.7	
Delay (s)		43.4		514.8	12.4		10.2	20.8	12.6	293.2	399.4	
Level of Service		D		F	B		B	C	B	F	F	
Approach Delay (s)		43.4			194.6			17.7		365.5		
Approach LOS		D			F			B		F		

Intersection Summary











HCM Average Control Delay	183.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.95		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.4
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group











HCM Unsignalized Intersection Capacity Analysis 62: E Divisadero St & N Roosevelt Ave.

4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	410	108	206	618	98	328
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	446	117	224	672	107	357
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			387			273
pX, platoon unblocked						
vC, conflicting volume	793	224			896	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	793	224			896	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	86			86	
cM capacity (veh/h)	307	816			758	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	563	224	672	463		
Volume Left	446	0	0	107		
Volume Right	117	0	672	0		
cSH	353	1700	1700	758		
Volume to Capacity	1.60	0.13	0.40	0.14		
Queue Length 95th (ft)	818	0	0	12		
Control Delay (s)	308.1	0.0	0.0	3.9		
Lane LOS	F			A		
Approach Delay (s)	308.1	0.0		3.9		
Approach LOS	F					
Intersection Summary						
Average Delay			91.2			
Intersection Capacity Utilization			72.8%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 62: E Divisadero St & N Roosevelt Ave.




















4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	647	385	321	706	0	652
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	703	418	349	767	0	709
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			375			274
pX, platoon unblocked						
vC, conflicting volume	1058	349			1116	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1058	349			1116	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	40			100	
cM capacity (veh/h)	249	694			626	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	1122	349	767	709		
Volume Left	703	0	0	0		
Volume Right	418	0	767	0		
cSH	327	1700	1700	626		
Volume to Capacity	3.43	0.21	0.45	0.00		
Queue Length 95th (ft)	Err	0	0	0		
Control Delay (s)	Err	0.0	0.0	0.0		
Lane LOS	F					
Approach Delay (s)	Err	0.0		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			3806.3			
Intersection Capacity Utilization			100.4%	ICU Level of Service		G
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St

4/25/2011

												
Movement	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBR2	SEL
Lane Configurations												
Volume (vph)	635	96	10	350	459	1	42	284	0	42	3	719
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6			4.6	4.6				4.6	4.6	4.2	4.6
Lane Util. Factor	1.00			0.95	0.95				0.95	1.00	1.00	0.97
Frt	0.98			0.98	0.85				1.00	0.85	0.86	0.93
Flt Protected	1.00			1.00	1.00				0.95	1.00	1.00	0.97
Satd. Flow (prot)	1830			1727	1504				3362	1583	1611	3274
Flt Permitted	1.00			0.73	1.00				0.95	1.00	1.00	0.46
Satd. Flow (perm)	1830			1257	1504				3362	1583	1611	1529
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	690	104	11	380	499	1	46	309	0	46	3	782
RTOR Reduction (vph)	3	0	0	0	0	0	0	0	0	40	3	0
Lane Group Flow (vph)	791	0	0	461	430	0	0	0	355	6	0	1465
Turn Type			Perm		Perm		Perm	Perm		Perm	custom	
Protected Phases	6			6					4		8	5
Permitted Phases			6		6		4	4		4		2
Actuated Green, G (s)	59.4			59.4	59.4				17.6	17.6	18.0	35.4
Effective Green, g (s)	59.4			59.4	59.4				17.6	17.6	18.0	35.4
Actuated g/C Ratio	0.47			0.47	0.47				0.14	0.14	0.14	0.28
Clearance Time (s)	4.6			4.6	4.6				4.6	4.6	4.2	4.6
Vehicle Extension (s)	5.0			5.0	5.0				4.0	4.0	2.0	5.0
Lane Grp Cap (vph)	861			592	708				469	221	230	918
v/s Ratio Prot	c0.43										0.00	c0.45
v/s Ratio Perm				0.37	0.29				0.11	0.00		
v/c Ratio	0.92			0.78	0.61				1.44dl	0.03	0.00	1.60
Uniform Delay, d1	31.1			27.9	24.8				52.2	46.9	46.4	45.4
Progression Factor	1.00			1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2	15.2			7.5	2.2				7.3	0.1	0.0	273.3
Delay (s)	46.3			35.4	26.9				59.5	47.0	46.4	318.7
Level of Service	D			D	C				E	D	D	F
Approach Delay (s)	46.3			31.3					58.1			318.7
Approach LOS	D			C					E			F

Intersection Summary

HCM Average Control Delay	156.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	126.2	Sum of lost time (s)	13.8
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		



dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St




















4/25/2011

		
Movement	SER	SER2
Lane Configurations		
Volume (vph)	627	1
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	682	1
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St

4/25/2011

												
Movement	EBT	EBR	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBR2	SEL2	SEL
Lane Configurations												
Volume (vph)	661	40	223	1344	2	9	682	0	44	6	1	987
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6		4.6	4.6				4.6	4.6	4.2		4.6
Lane Util. Factor	1.00		0.95	0.95				0.95	1.00	1.00		0.97
Frt	0.99		0.89	0.85				1.00	0.85	0.86		0.95
Flt Protected	1.00		1.00	1.00				0.95	1.00	1.00		0.97
Satd. Flow (prot)	1849		1578	1504				3362	1583	1611		3328
Flt Permitted	1.00		1.00	1.00				0.95	1.00	1.00		0.95
Satd. Flow (perm)	1849		1578	1504				3362	1583	1611		3287
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	718	43	242	1461	2	10	741	0	48	7	1	1073
RTOR Reduction (vph)	1	0	0	0	0	0	0	0	32	6	0	0
Lane Group Flow (vph)	760	0	870	835	0	0	0	751	16	1	0	1574
Turn Type				custom		Perm	Perm		Perm	custom	Perm	
Protected Phases	6		6	2				4		8		5
Permitted Phases				6		4	4		4		5	2
Actuated Green, G (s)	54.4		54.4	76.8				24.4	24.4	24.8		52.8
Effective Green, g (s)	54.4		54.4	76.8				24.4	24.4	24.8		52.8
Actuated g/C Ratio	0.36		0.36	0.51				0.16	0.16	0.17		0.35
Clearance Time (s)	4.6		4.6	4.6				4.6	4.6	4.2		4.6
Vehicle Extension (s)	5.0		5.0	5.0				4.0	4.0	2.0		5.0
Lane Grp Cap (vph)	671		572	770				547	258	266		1165
v/s Ratio Prot	0.41		c0.55	0.16						0.00		c0.27
v/s Ratio Perm				0.39				0.22	0.01			c0.20
v/c Ratio	1.13		1.52	1.08				2.61dl	0.06	0.00		1.35
Uniform Delay, d1	47.8		47.8	36.6				62.8	53.1	52.3		51.8
Progression Factor	1.00		1.00	1.00				1.00	1.00	1.00		1.00
Incremental Delay, d2	77.2		243.3	57.7				179.2	0.1	0.0		163.7
Delay (s)	125.0		291.1	94.3				242.0	53.3	52.3		215.5
Level of Service	F		F	F				F	D	D		F
Approach Delay (s)	125.0		194.7					230.6				215.5
Approach LOS	F		F					F				F

Intersection Summary

HCM Average Control Delay	196.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		



dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

63: E Divisadero St & N Echo St




















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Movement	SER	SER2
Lane Configurations		
Volume (vph)	454	6
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	493	7
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

64: E Divisadero St & Broadway St




















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	86	1021	258	15	620	31	157	299	151	20	31	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.95		1.00	0.97	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3526	1583		3510		1770	1769		1770	1815	
Flt Permitted		0.83	1.00		0.92		0.73	1.00		0.29	1.00	
Satd. Flow (perm)		2922	1583		3228		1360	1769		546	1815	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	1110	280	16	674	34	171	325	164	22	34	7
RTOR Reduction (vph)	0	0	116	0	6	0	0	30	0	0	4	0
Lane Group Flow (vph)	0	1203	164	0	718	0	171	459	0	22	37	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Actuated Green, G (s)		26.6	26.6		26.6		22.1	22.1		22.1	22.1	
Effective Green, g (s)		26.6	26.6		26.6		22.1	22.1		22.1	22.1	
Actuated g/C Ratio		0.46	0.46		0.46		0.38	0.38		0.38	0.38	
Clearance Time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1342	727		1483		519	675		208	693	
v/s Ratio Prot								c0.26			0.02	
v/s Ratio Perm		c0.41	0.10		0.22		0.13			0.04		
v/c Ratio		0.90	0.23		0.48		0.33	0.68		0.11	0.05	
Uniform Delay, d1		14.4	9.4		10.9		12.7	15.0		11.5	11.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.0	0.1		0.1		0.1	2.3		0.1	0.0	
Delay (s)		22.3	9.5		11.0		12.8	17.2		11.6	11.3	
Level of Service		C	A		B		B	B		B	B	
Approach Delay (s)		19.9			11.0			16.1			11.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			16.7			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			57.9			Sum of lost time (s)			9.2			
Intersection Capacity Utilization			85.7%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

64: E Divisadero St & Broadway St



















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	75	1030	286	41	1187	158	153	228	85	297	297	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor		0.95	1.00		0.95		1.00	1.00		1.00	1.00	
Fr _t		1.00	0.85		0.98		1.00	0.96		1.00	0.98	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3527	1583		3473		1770	1787		1770	1835	
Flt Permitted		0.59	1.00		0.82		0.40	1.00		0.42	1.00	
Satd. Flow (perm)		2072	1583		2841		744	1787		785	1835	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	1120	311	45	1290	172	166	248	92	323	323	36
RTOR Reduction (vph)	0	0	83	0	11	0	0	15	0	0	4	0
Lane Group Flow (vph)	0	1202	228	0	1496	0	166	325	0	323	355	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Actuated Green, G (s)		46.4	46.4		46.4		34.4	34.4		34.4	34.4	
Effective Green, g (s)		46.4	46.4		46.4		34.4	34.4		34.4	34.4	
Actuated g/C Ratio		0.52	0.52		0.52		0.38	0.38		0.38	0.38	
Clearance Time (s)		4.6	4.6		4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		0.2	0.2		0.2		0.2	0.2		0.2	0.2	
Lane Grp Cap (vph)		1068	816		1465		284	683		300	701	
v/s Ratio Prot								0.18			0.19	
v/s Ratio Perm		c0.58	0.14		0.53		0.22			c0.41		
v/c Ratio		1.13	0.28		1.02		0.58	0.48		1.08	0.51	
Uniform Delay, d1		21.8	12.3		21.8		22.1	21.0		27.8	21.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		68.9	0.1		29.0		2.0	0.2		73.9	0.2	
Delay (s)		90.7	12.4		50.8		24.1	21.2		101.7	21.5	
Level of Service		F	B		D		C	C		F	C	
Approach Delay (s)		74.6			50.8			22.1			59.5	
Approach LOS		E			D			C			E	
Intersection Summary												
HCM Average Control Delay			57.3			HCM Level of Service				E		
HCM Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			9.2			
Intersection Capacity Utilization			121.7%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

65: E Divisadero St & N Fulton St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1173	18	8	287	0	27	0	16	222	505	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	0.95	
Frt		1.00			1.00		1.00		0.85	1.00	0.94	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3531			3534		1770		1583	1770	3315	
Flt Permitted		1.00			0.92		0.19		1.00	0.95	1.00	
Satd. Flow (perm)		3531			3244		350		1583	1770	3315	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1275	20	9	312	0	29	0	17	241	549	402
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	10	0	222	0
Lane Group Flow (vph)	0	1293	0	0	321	0	29	0	7	241	729	0
Turn Type				Perm			D.Pm		custom		Perm	
Protected Phases		4			4				2		2	
Permitted Phases				4			2		2	2		
Actuated Green, G (s)		26.2			26.2		24.1		24.1	24.1	24.1	
Effective Green, g (s)		26.2			26.2		24.1		24.1	24.1	24.1	
Actuated g/C Ratio		0.44			0.44		0.41		0.41	0.41	0.41	
Clearance Time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Vehicle Extension (s)		2.0			2.0		2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)		1560			1433		142		643	719	1347	
v/s Ratio Prot		c0.37							0.00		c0.22	
v/s Ratio Perm					0.10		0.08			0.14		
v/c Ratio		0.83			0.22		0.20		0.01	0.34	0.54	
Uniform Delay, d1		14.6			10.3		11.4		10.5	12.1	13.4	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		3.6			0.0		0.3		0.0	0.1	0.2	
Delay (s)		18.2			10.3		11.7		10.5	12.2	13.6	
Level of Service		B			B		B		B	B	B	
Approach Delay (s)		18.2			10.3			11.2			13.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			15.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			59.3			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			84.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

65: E Divisadero St & N Fulton St
















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1184	27	7	1073	0	30	0	43	270	221	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	0.95	
Frt		1.00			1.00		1.00		0.85	1.00	0.91	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3528			3538		1770		1583	1770	3220	
Flt Permitted		1.00			0.94		0.37		1.00	0.95	1.00	
Satd. Flow (perm)		3528			3342		690		1583	1770	3220	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1287	29	8	1166	0	33	0	47	293	240	361
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	13	0	18	0
Lane Group Flow (vph)	0	1313	0	0	1174	0	33	0	34	293	583	0
Turn Type			Perm			D.Pm		custom		Perm		
Protected Phases		4			4			2		2		2
Permitted Phases				4			2		2		2	
Actuated Green, G (s)		26.5			26.5		24.1		24.1	24.1	24.1	
Effective Green, g (s)		26.5			26.5		24.1		24.1	24.1	24.1	
Actuated g/C Ratio		0.44			0.44		0.40		0.40	0.40	0.40	
Clearance Time (s)		4.5			4.5		4.5		4.5	4.5	4.5	
Vehicle Extension (s)		2.0			2.0		2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)		1569			1486		279		640	716	1302	
v/s Ratio Prot		c0.37							0.02		c0.18	
v/s Ratio Perm					0.35		0.05			0.17		
v/c Ratio		0.84			0.79		0.12		0.05	0.41	0.45	
Uniform Delay, d1		14.6			14.2		11.1		10.8	12.7	12.9	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		3.9			2.7		0.1		0.0	0.1	0.1	
Delay (s)		18.5			16.9		11.2		10.8	12.8	13.0	
Level of Service		B			B		B		B	B	B	
Approach Delay (s)		18.5			16.9			11.0			12.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			16.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			59.6			Sum of lost time (s)			9.0			
Intersection Capacity Utilization			84.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

66: E Divisadero St & N Van Ness Ave
















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	398	720	239	6	226	44	60	129	15	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5			4.2				
Lane Util. Factor		0.95			0.95			0.95				
Frt		0.97			0.98			0.99				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3396			3451			3450				
Flt Permitted		0.75			0.92			0.99				
Satd. Flow (perm)		2580			3189			3450				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	433	783	260	7	246	48	65	140	16	0	0	0
RTOR Reduction (vph)	0	23	0	0	20	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	1453	0	0	281	0	0	214	0	0	0	0
Turn Type	Perm			Perm			Split					
Protected Phases		8			4		6	6				
Permitted Phases	8			4								
Actuated Green, G (s)		44.3			44.3			22.1				
Effective Green, g (s)		44.3			44.3			22.1				
Actuated g/C Ratio		0.59			0.59			0.29				
Clearance Time (s)		4.5			4.5			4.2				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		1522			1881			1015				
v/s Ratio Prot								c0.06				
v/s Ratio Perm		c0.56			0.09							
v/c Ratio		0.95			0.15			0.21				
Uniform Delay, d1		14.5			6.9			19.9				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		13.6			0.0			0.0				
Delay (s)		28.0			6.9			20.0				
Level of Service		C			A			B				
Approach Delay (s)		28.0			6.9			20.0			0.0	
Approach LOS		C			A			B			A	
Intersection Summary												
HCM Average Control Delay			24.0			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			75.1			Sum of lost time (s)			8.7			
Intersection Capacity Utilization			90.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

66: E Divisadero St & N Van Ness Ave



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	800	508	165	9	897	108	178	459	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.5			4.5			4.2				
Lane Util. Factor		0.95			0.95			0.95				
Frt		0.98			0.98			1.00				
Flt Protected		0.97			1.00			0.99				
Satd. Flow (prot)		3388			3481			3478				
Flt Permitted		0.50			0.93			0.99				
Satd. Flow (perm)		1733			3242			3478				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	870	552	179	10	975	117	193	499	18	0	0	0
RTOR Reduction (vph)	0	7	0	0	7	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	1594	0	0	1095	0	0	708	0	0	0	0
Turn Type	Perm			Perm			Split					
Protected Phases		8			4		6	6				
Permitted Phases	8			4								
Actuated Green, G (s)		104.5			104.5			26.8				
Effective Green, g (s)		104.5			104.5			26.8				
Actuated g/C Ratio		0.75			0.75			0.19				
Clearance Time (s)		4.5			4.5			4.2				
Vehicle Extension (s)		0.2			0.2			0.2				
Lane Grp Cap (vph)		1294			2420			666				
v/s Ratio Prot								c0.20				
v/s Ratio Perm		c0.92			0.34							
v/c Ratio		2.69dl			0.45			1.06				
Uniform Delay, d1		17.8			6.8			56.6				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		111.3			0.0			53.0				
Delay (s)		129.1			6.8			109.6				
Level of Service		F			A			F				
Approach Delay (s)		129.1			6.8			109.6			0.0	
Approach LOS		F			A			F			A	
Intersection Summary												
HCM Average Control Delay			85.6			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			8.7			
Intersection Capacity Utilization			102.2%			ICU Level of Service			G			
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

67: N Roosevelt Ave. & N H St

4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	308	0	18	2	0	0	1	1331	292	140	516	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00		0.95	
Frt	1.00	0.85			1.00			1.00	0.85		1.00	
Flt Protected	0.95	1.00			0.95			1.00	1.00		0.99	
Satd. Flow (prot)	1770	1583			1770			3539	1583		3497	
Flt Permitted	0.76	1.00			0.74			0.95	1.00		0.51	
Satd. Flow (perm)	1409	1583			1386			3379	1583		1808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	335	0	20	2	0	0	1	1447	317	152	561	7
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	100	0	0	0
Lane Group Flow (vph)	335	15	0	0	2	0	0	1448	217	0	720	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)	29.6	29.6			29.6			40.9	40.9		40.9	
Effective Green, g (s)	29.6	29.6			29.6			40.9	40.9		40.9	
Actuated g/C Ratio	0.37	0.37			0.37			0.52	0.52		0.52	
Clearance Time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Vehicle Extension (s)	5.0	5.0			5.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	526	591			517			1743	816		932	
v/s Ratio Prot		0.01										
v/s Ratio Perm	c0.24				0.00			c0.43	0.14		0.40	
v/c Ratio	0.64	0.03			0.00			0.83	0.27		1.60dl	
Uniform Delay, d1	20.4	15.7			15.6			16.3	10.8		15.4	
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.5	0.0			0.0			3.7	0.2		4.3	
Delay (s)	23.9	15.8			15.6			20.0	11.0		19.7	
Level of Service	C	B			B			B	B		B	
Approach Delay (s)		23.5			15.6			18.3			19.7	
Approach LOS		C			B			B			B	

Intersection Summary

HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	8.8
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		



















dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

67: N Roosevelt Ave. & N H St

4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	674	0	23	0	2	0	1	1421	570	78	1144	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Lane Util. Factor	1.00	1.00			1.00			0.95	1.00		0.95	
Frt	1.00	0.85			1.00			1.00	0.85		1.00	
Flt Protected	0.95	1.00			1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1770	1583			1863			3539	1583		3528	
Flt Permitted	0.76	1.00			1.00			0.95	1.00		0.52	
Satd. Flow (perm)	1409	1583			1863			3378	1583		1838	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	733	0	25	0	2	0	1	1545	620	85	1243	1
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	150	0	0	0
Lane Group Flow (vph)	733	15	0	0	2	0	0	1546	470	0	1329	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)	64.4	64.4			64.4			76.8	76.8		76.8	
Effective Green, g (s)	64.4	64.4			64.4			76.8	76.8		76.8	
Actuated g/C Ratio	0.43	0.43			0.43			0.51	0.51		0.51	
Clearance Time (s)	4.6	4.6			4.6			4.2	4.2		4.2	
Vehicle Extension (s)	5.0	5.0			5.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	605	680			800			1730	810		941	
v/s Ratio Prot		0.01			0.00							
v/s Ratio Perm	c0.52							0.46	0.30		c0.72	
v/c Ratio	1.21	0.02			0.00			0.89	0.58		1.70dl	
Uniform Delay, d1	42.8	24.7			24.5			32.9	25.4		36.6	
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2	110.0	0.0			0.0			6.5	1.3		191.9	
Delay (s)	152.8	24.7			24.5			39.4	26.7		228.5	
Level of Service	F	C			C			D	C		F	
Approach Delay (s)		148.5			24.5			35.8			228.5	
Approach LOS		F			C			D			F	

Intersection Summary

HCM Average Control Delay	116.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	128.1%	ICU Level of Service	H
Analysis Period (min)	15		


















dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

68: E McKenzie Ave. & N Blackstone Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	174	59	86	114	0	0	0	0	181	1365	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.9	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.97			1.00						0.99	
Flt Protected		1.00			0.98						0.99	
Satd. Flow (prot)		1799			1824						5021	
Flt Permitted		1.00			0.75						0.99	
Satd. Flow (perm)		1799			1395						5021	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	189	64	93	124	0	0	0	0	197	1484	85
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	244	0	0	217	0	0	0	0	0	1756	0
Turn Type				Perm						Split		
Protected Phases		8			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		13.1			13.1						23.3	
Effective Green, g (s)		13.1			13.1						23.3	
Actuated g/C Ratio		0.29			0.29						0.51	
Clearance Time (s)		4.2			4.2						4.9	
Vehicle Extension (s)		4.0			4.0						5.0	
Lane Grp Cap (vph)		518			402						2571	
v/s Ratio Prot		0.14									c0.35	
v/s Ratio Perm					c0.16							
v/c Ratio		0.47			0.54						0.68	
Uniform Delay, d1		13.3			13.7						8.3	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.9			1.8						1.0	
Delay (s)		14.3			15.4						9.3	
Level of Service		B			B						A	
Approach Delay (s)		14.3			15.4			0.0			9.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.5			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			45.5			Sum of lost time (s)				9.1		
Intersection Capacity Utilization			66.4%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

68: E McKenzie Ave. & N Blackstone Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	326	160	164	303	0	0	0	0	184	1754	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.9	
Lane Util. Factor		1.00			1.00						0.91	
Frt		0.96			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1780			1831						4993	
Flt Permitted		1.00			0.45						1.00	
Satd. Flow (perm)		1780			840						4993	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	354	174	178	329	0	0	0	0	200	1907	215
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	527	0	0	507	0	0	0	0	0	2311	0
Turn Type				Perm						Split		
Protected Phases		8			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		54.8			54.8						46.1	
Effective Green, g (s)		54.8			54.8						46.1	
Actuated g/C Ratio		0.50			0.50						0.42	
Clearance Time (s)		4.2			4.2						4.9	
Vehicle Extension (s)		4.0			4.0						5.0	
Lane Grp Cap (vph)		887			418						2093	
v/s Ratio Prot		0.30									c0.46	
v/s Ratio Perm					c0.60							
v/c Ratio		0.59			1.21						1.10	
Uniform Delay, d1		19.7			27.6						31.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.3			116.1						54.7	
Delay (s)		20.9			143.7						86.6	
Level of Service		C			F						F	
Approach Delay (s)		20.9			143.7			0.0			86.6	
Approach LOS		C			F			A			F	
Intersection Summary												
HCM Average Control Delay			84.9			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			9.1			
Intersection Capacity Utilization			105.0%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

69: E McKenzie Ave. & N Abby St


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	73	265	0	0	161	92	45	627	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2			4.9				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.95			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		1843			1771			5008				
Flt Permitted		0.87			1.00			1.00				
Satd. Flow (perm)		1624			1771			5008				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	288	0	0	175	100	49	682	64	0	0	0
RTOR Reduction (vph)	0	0	0	0	45	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	367	0	0	230	0	0	776	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		15.3			15.3			19.2				
Effective Green, g (s)		15.3			15.3			19.2				
Actuated g/C Ratio		0.35			0.35			0.44				
Clearance Time (s)		4.2			4.2			4.9				
Vehicle Extension (s)		4.0			4.0			0.2				
Lane Grp Cap (vph)		570			621			2205				
v/s Ratio Prot					0.13			0.15				
v/s Ratio Perm		0.23										
v/c Ratio		0.64			0.37			0.35				
Uniform Delay, d1		11.9			10.6			8.1				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.8			0.5			0.0				
Delay (s)		14.6			11.1			8.1				
Level of Service		B			B			A				
Approach Delay (s)		14.6			11.1			8.1			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.3		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			43.6		Sum of lost time (s)				9.1			
Intersection Capacity Utilization			59.0%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

69: E McKenzie Ave. & N Abby St

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	66	110	0	0	136	151	37	1481	46	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2			4.9				
Lane Util. Factor		1.00			1.00			0.91				
Frt		1.00			0.93			1.00				
Flt Protected		0.98			1.00			1.00				
Satd. Flow (prot)		1828			1731			5057				
Flt Permitted		0.78			1.00			1.00				
Satd. Flow (perm)		1457			1731			5057				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	120	0	0	148	164	40	1610	50	0	0	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	192	0	0	307	0	0	1694	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		13.4			13.4			20.3				
Effective Green, g (s)		13.4			13.4			20.3				
Actuated g/C Ratio		0.31			0.31			0.47				
Clearance Time (s)		4.2			4.2			4.9				
Vehicle Extension (s)		4.0			4.0			0.2				
Lane Grp Cap (vph)		456			542			2399				
v/s Ratio Prot					c0.18			c0.34				
v/s Ratio Perm		0.13										
v/c Ratio		0.42			0.57			0.71				
Uniform Delay, d1		11.6			12.3			8.9				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.9			1.7			0.8				
Delay (s)		12.5			13.9			9.7				
Level of Service		B			B			A				
Approach Delay (s)		12.5			13.9			9.7			0.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			10.5		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			42.8		Sum of lost time (s)				9.1			
Intersection Capacity Utilization			67.3%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

70: 180 EB Off-Ramp & N Fulton St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 									 	
Volume (vph)	0	636	131	0	0	0	0	0	0	886	834	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2									4.6	
Lane Util. Factor		0.95									0.95	
Frt		0.97									1.00	
Flt Protected		1.00									0.97	
Satd. Flow (prot)		3449									3450	
Flt Permitted		1.00									0.97	
Satd. Flow (perm)		3449									3450	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	691	142	0	0	0	0	0	0	963	907	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	38	0
Lane Group Flow (vph)	0	813	0	0	0	0	0	0	0	0	1832	0
Turn Type										Perm		
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		30.9									49.0	
Effective Green, g (s)		30.9									49.0	
Actuated g/C Ratio		0.35									0.55	
Clearance Time (s)		4.2									4.6	
Vehicle Extension (s)		6.4									5.6	
Lane Grp Cap (vph)		1202									1906	
v/s Ratio Prot		0.24										
v/s Ratio Perm											0.53	
v/c Ratio		0.68									0.96	
Uniform Delay, d1		24.6									18.9	
Progression Factor		1.00									1.00	
Incremental Delay, d2		2.5									13.0	
Delay (s)		27.1									32.0	
Level of Service		C									C	
Approach Delay (s)		27.1			0.0			0.0			32.0	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM Average Control Delay			30.5								C	
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			88.7							8.8		
Intersection Capacity Utilization			78.2%							D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

70: 180 EB Off-Ramp & N Fulton St
















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  									  	
Volume (vph)	0	563	213	0	0	0	0	0	0	857	584	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2									4.6	
Lane Util. Factor		0.95									0.95	
Frt		0.96									1.00	
Flt Protected		1.00									0.97	
Satd. Flow (prot)		3393									3437	
Flt Permitted		1.00									0.97	
Satd. Flow (perm)		3393									3437	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	612	232	0	0	0	0	0	0	932	635	0
RTOR Reduction (vph)	0	55	0	0	0	0	0	0	0	0	87	0
Lane Group Flow (vph)	0	789	0	0	0	0	0	0	0	0	1480	0
Turn Type										Perm		
Protected Phases		4									6	
Permitted Phases										6		
Actuated Green, G (s)		28.8									34.3	
Effective Green, g (s)		28.8									34.3	
Actuated g/C Ratio		0.40									0.48	
Clearance Time (s)		4.2									4.6	
Vehicle Extension (s)		6.4									5.6	
Lane Grp Cap (vph)		1359									1640	
v/s Ratio Prot		c0.23										
v/s Ratio Perm											0.43	
v/c Ratio		0.58									1.00dl	
Uniform Delay, d1		16.8									17.3	
Progression Factor		1.00									1.00	
Incremental Delay, d2		1.3									8.0	
Delay (s)		18.1									25.2	
Level of Service		B									C	
Approach Delay (s)		18.1			0.0			0.0			25.2	
Approach LOS		B			A			A			C	
Intersection Summary												
HCM Average Control Delay			22.7			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			71.9			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			77.2%			ICU Level of Service			D			
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

71: 180 EB On-Ramp & N Van Ness Ave

















4/25/2011

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	370	1155	0	0	272	311	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6	4.6					
Lane Util. Factor	1.00	1.00			0.95	1.00					
Frt	1.00	1.00			1.00	0.85					
Flt Protected	0.95	0.95			1.00	1.00					
Satd. Flow (prot)	1770	1770			3539	1583					
Flt Permitted	0.95	0.95			1.00	1.00					
Satd. Flow (perm)	1770	1770			3539	1583					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	402	1255	0	0	296	338	0	0	0	0	0
RTOR Reduction (vph)	41	0	0	0	0	87	0	0	0	0	0
Lane Group Flow (vph)	361	1255	0	0	296	251	0	0	0	0	0
Turn Type	Split					Perm					
Protected Phases	4	4			2						
Permitted Phases						2					
Actuated Green, G (s)	71.4	71.4			18.4	18.4					
Effective Green, g (s)	71.4	71.4			18.4	18.4					
Actuated g/C Ratio	0.72	0.72			0.19	0.19					
Clearance Time (s)	4.6	4.6			4.6	4.6					
Vehicle Extension (s)	5.0	5.0			4.5	4.5					
Lane Grp Cap (vph)	1277	1277			658	294					
v/s Ratio Prot	0.20	c0.71			0.08						
v/s Ratio Perm						c0.16					
v/c Ratio	0.28	0.98			0.45	0.85					
Uniform Delay, d1	4.8	13.2			35.8	39.0					
Progression Factor	1.00	1.00			1.00	1.00					
Incremental Delay, d2	0.3	21.1			0.8	21.9					
Delay (s)	5.1	34.4			36.7	60.9					
Level of Service	A	C			D	E					
Approach Delay (s)		27.3			49.6			0.0		0.0	
Approach LOS		C			D			A		A	
Intersection Summary											
HCM Average Control Delay			33.4		HCM Level of Service				C		
HCM Volume to Capacity ratio			0.96								
Actuated Cycle Length (s)			99.0		Sum of lost time (s)				9.2		
Intersection Capacity Utilization			80.0%		ICU Level of Service				D		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

71: 180 EB On-Ramp & N Van Ness Ave



















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Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations					 						
Volume (vph)	321	1101	0	0	473	780	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6			4.6	4.6					
Lane Util. Factor	1.00	1.00			0.95	1.00					
Frt	1.00	1.00			1.00	0.85					
Flt Protected	0.95	0.95			1.00	1.00					
Satd. Flow (prot)	1770	1770			3539	1583					
Flt Permitted	0.95	0.95			1.00	1.00					
Satd. Flow (perm)	1770	1770			3539	1583					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	349	1197	0	0	514	848	0	0	0	0	0
RTOR Reduction (vph)	77	0	0	0	0	33	0	0	0	0	0
Lane Group Flow (vph)	272	1197	0	0	514	815	0	0	0	0	0
Turn Type	Split					Perm					
Protected Phases	4	4			2						
Permitted Phases						2					
Actuated Green, G (s)	80.4	80.4			60.4	60.4					
Effective Green, g (s)	80.4	80.4			60.4	60.4					
Actuated g/C Ratio	0.54	0.54			0.40	0.40					
Clearance Time (s)	4.6	4.6			4.6	4.6					
Vehicle Extension (s)	5.0	5.0			4.5	4.5					
Lane Grp Cap (vph)	949	949			1425	637					
v/s Ratio Prot	0.15	c0.68			0.15						
v/s Ratio Perm						c0.51					
v/c Ratio	0.29	1.26			0.36	1.28					
Uniform Delay, d1	19.1	34.8			31.3	44.8					
Progression Factor	1.00	1.00			1.00	1.00					
Incremental Delay, d2	0.4	126.1			0.3	137.7					
Delay (s)	19.4	160.9			31.6	182.5					
Level of Service	B	F			C	F					
Approach Delay (s)		129.0			125.5			0.0		0.0	
Approach LOS		F			F			A		A	
Intersection Summary											
HCM Average Control Delay			127.4			HCM Level of Service			F		
HCM Volume to Capacity ratio			1.27								
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			9.2		
Intersection Capacity Utilization			81.7%			ICU Level of Service			D		
Analysis Period (min)			15								
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

72: 180 WB Ramps & N Fulton St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	1013	563	6	37	0	0	0	0	0	953	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.7	3.7		3.7						4.1	
Lane Util. Factor		1.00	1.00		1.00						0.95	
Frt		1.00	0.85		1.00						0.98	
Flt Protected		1.00	1.00		0.99						1.00	
Satd. Flow (prot)		1863	1583		1849						3460	
Flt Permitted		1.00	1.00		0.67						1.00	
Satd. Flow (perm)		1863	1583		1250						3460	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1101	612	7	40	0	0	0	0	0	1036	182
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	1101	604	0	47	0	0	0	0	0	1204	0
Turn Type			Perm		Perm							
Protected Phases		4			8						6	
Permitted Phases			4		8							
Actuated Green, G (s)		57.3	57.3		57.3						34.9	
Effective Green, g (s)		57.3	57.3		57.3						34.9	
Actuated g/C Ratio		0.57	0.57		0.57						0.35	
Clearance Time (s)		3.7	3.7		3.7						4.1	
Vehicle Extension (s)		5.0	5.0		4.8						4.6	
Lane Grp Cap (vph)		1067	907		716						1208	
v/s Ratio Prot		c0.59									c0.35	
v/s Ratio Perm			0.38		0.04							
v/c Ratio		1.03	0.67		0.07						1.00	
Uniform Delay, d1		21.4	14.7		9.5						32.5	
Progression Factor		1.00	1.00		1.00						1.00	
Incremental Delay, d2		36.1	2.5		0.1						24.9	
Delay (s)		57.4	17.2		9.5						57.4	
Level of Service		E	B		A						E	
Approach Delay (s)		43.0			9.5			0.0			57.4	
Approach LOS		D			A			A			E	
Intersection Summary												
HCM Average Control Delay			48.4			HCM Level of Service				D		
HCM Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			7.8			
Intersection Capacity Utilization			91.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

72: 180 WB Ramps & N Fulton St









4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	1303	479	7	65	0	0	0	0	0	955	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.7	3.7		3.7						4.1	
Lane Util. Factor		1.00	1.00		1.00						0.95	
Frt		1.00	0.85		1.00						0.96	
Flt Protected		1.00	1.00		0.99						1.00	
Satd. Flow (prot)		1863	1583		1853						3403	
Flt Permitted		1.00	1.00		0.64						1.00	
Satd. Flow (perm)		1863	1583		1183						3403	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1416	521	8	71	0	0	0	0	0	1038	357
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	1416	513	0	79	0	0	0	0	0	1366	0
Turn Type			Perm		Perm							
Protected Phases		4			8						6	
Permitted Phases			4		8							
Actuated Green, G (s)		70.3	70.3		70.3						41.9	
Effective Green, g (s)		70.3	70.3		70.3						41.9	
Actuated g/C Ratio		0.59	0.59		0.59						0.35	
Clearance Time (s)		3.7	3.7		3.7						4.1	
Vehicle Extension (s)		5.0	5.0		4.8						4.6	
Lane Grp Cap (vph)		1091	927		693						1188	
v/s Ratio Prot		c0.76									c0.40	
v/s Ratio Perm			0.32		0.07							
v/c Ratio		1.30	0.55		0.11						1.15	
Uniform Delay, d1		24.9	15.2		11.0						39.0	
Progression Factor		1.00	1.00		1.00						1.00	
Incremental Delay, d2		140.9	1.2		0.1						77.7	
Delay (s)		165.7	16.5		11.2						116.7	
Level of Service		F	B		B						F	
Approach Delay (s)		125.6			11.2			0.0			116.7	
Approach LOS		F			B			A			F	
Intersection Summary												
HCM Average Control Delay			119.3			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				7.8		
Intersection Capacity Utilization			112.2%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

73: 180 WB Ramps & N Van Ness Ave









4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1040	0	42	610	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.6			4.6		
Lane Util. Factor	1.00			0.95		
Frt	1.00			1.00		
Flt Protected	0.95			1.00		
Satd. Flow (prot)	1770			3528		
Flt Permitted	0.95			1.00		
Satd. Flow (perm)	1770			3528		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1130	0	46	663	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1130	0	0	709	0	0
Turn Type			Split			
Protected Phases	4		2	2		
Permitted Phases						
Actuated Green, G (s)	57.4			22.8		
Effective Green, g (s)	57.4			22.8		
Actuated g/C Ratio	0.64			0.26		
Clearance Time (s)	4.6			4.6		
Vehicle Extension (s)	3.3			4.9		
Lane Grp Cap (vph)	1136			900		
v/s Ratio Prot	c0.64			c0.20		
v/s Ratio Perm						
v/c Ratio	0.99			0.79		
Uniform Delay, d1	15.8			31.0		
Progression Factor	1.00			1.00		
Incremental Delay, d2	25.3			5.3		
Delay (s)	41.1			36.4		
Level of Service	D			D		
Approach Delay (s)	41.1			36.4	0.0	
Approach LOS	D			D	A	
Intersection Summary						
HCM Average Control Delay			39.3	HCM Level of Service		D
HCM Volume to Capacity ratio			0.94			
Actuated Cycle Length (s)			89.4	Sum of lost time (s)		9.2
Intersection Capacity Utilization			83.4%	ICU Level of Service		E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

73: 180 WB Ramps & N Van Ness Ave

















4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1305	0	73	719	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.6			4.6		
Lane Util. Factor	1.00			0.95		
Frt	1.00			1.00		
Flt Protected	0.95			1.00		
Satd. Flow (prot)	1770			3523		
Flt Permitted	0.95			1.00		
Satd. Flow (perm)	1770			3523		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1418	0	79	782	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1418	0	0	861	0	0
Turn Type			Split			
Protected Phases	4		2	2		
Permitted Phases						
Actuated Green, G (s)	98.4			32.4		
Effective Green, g (s)	98.4			32.4		
Actuated g/C Ratio	0.70			0.23		
Clearance Time (s)	4.6			4.6		
Vehicle Extension (s)	3.3			4.9		
Lane Grp Cap (vph)	1244			815		
v/s Ratio Prot	c0.80			c0.24		
v/s Ratio Perm						
v/c Ratio	1.14			1.06		
Uniform Delay, d1	20.8			53.8		
Progression Factor	1.00			1.00		
Incremental Delay, d2	73.1			47.5		
Delay (s)	93.9			101.3		
Level of Service	F			F		
Approach Delay (s)	93.9			101.3	0.0	
Approach LOS	F			F	A	
Intersection Summary						
HCM Average Control Delay			96.7	HCM Level of Service		F
HCM Volume to Capacity ratio			1.12			
Actuated Cycle Length (s)			140.0	Sum of lost time (s)		9.2
Intersection Capacity Utilization			102.0%	ICU Level of Service		G
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

74: E Belmont Ave. & N Blackstone Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1474	145	111	376	0	0	0	0	376	1377	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	
Lane Util. Factor		0.95		1.00	0.95						0.91	
Frt		0.99		1.00	1.00						0.98	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		3492		1770	3539						4931	
Flt Permitted		1.00		0.95	1.00						0.99	
Satd. Flow (perm)		3492		1770	3539						4931	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1602	158	121	409	0	0	0	0	409	1497	316
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	1755	0	121	409	0	0	0	0	0	2207	0
Turn Type				Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases												
Actuated Green, G (s)		65.8		9.3	78.8						62.1	
Effective Green, g (s)		65.8		9.3	78.8						62.1	
Actuated g/C Ratio		0.44		0.06	0.53						0.41	
Clearance Time (s)		4.2		3.7	4.2						4.9	
Vehicle Extension (s)		6.8		2.0	6.8						0.2	
Lane Grp Cap (vph)		1532		110	1859						2041	
v/s Ratio Prot		c0.50		c0.07	0.12						c0.45	
v/s Ratio Perm												
v/c Ratio		1.15		1.10	0.22						1.08	
Uniform Delay, d1		42.1		70.3	19.1						44.0	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		73.7		115.3	0.2						45.9	
Delay (s)		115.8		185.6	19.3						89.8	
Level of Service		F		F	B						F	
Approach Delay (s)		115.8			57.3			0.0			89.8	
Approach LOS		F			E			A			F	
Intersection Summary												
HCM Average Control Delay			96.1			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			12.8			
Intersection Capacity Utilization			103.2%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

74: E Belmont Ave. & N Blackstone Ave























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1673	179	251	1353	0	0	0	0	364	1706	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	
Lane Util. Factor		0.95		1.00	0.95						0.91	
Frt		0.99		1.00	1.00						0.97	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		3488		1770	3539						4890	
Flt Permitted		1.00		0.95	1.00						0.99	
Satd. Flow (perm)		3488		1770	3539						4890	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1818	195	273	1471	0	0	0	0	396	1854	603
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	2007	0	273	1471	0	0	0	0	0	2840	0
Turn Type				Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases												
Actuated Green, G (s)		57.8		16.3	77.8						63.1	
Effective Green, g (s)		57.8		16.3	77.8						63.1	
Actuated g/C Ratio		0.39		0.11	0.52						0.42	
Clearance Time (s)		4.2		3.7	4.2						4.9	
Vehicle Extension (s)		6.8		2.0	6.8						0.2	
Lane Grp Cap (vph)		1344		192	1836						2057	
v/s Ratio Prot		c0.58		c0.15	0.42						c0.58	
v/s Ratio Perm												
v/c Ratio		1.49		1.42	0.80						1.38	
Uniform Delay, d1		46.1		66.8	29.7						43.5	
Progression Factor		1.00		1.00	1.00						1.00	
Incremental Delay, d2		226.1		217.4	3.2						174.3	
Delay (s)		272.2		284.3	33.0						217.8	
Level of Service		F		F	C						F	
Approach Delay (s)		272.2			72.3			0.0			217.8	
Approach LOS		F			E			A			F	
Intersection Summary												
HCM Average Control Delay			196.0			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.43									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				12.8		
Intersection Capacity Utilization			129.5%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

75: E Belmont Ave. & N Abby St























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			  				
Volume (vph)	908	934	0	0	459	158	44	699	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		5070	1583			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		5070	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	987	1015	0	0	499	172	48	760	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	58	0	0	19	0	0	0
Lane Group Flow (vph)	987	1015	0	0	499	114	0	808	8	0	0	0
Turn Type	Prot					Perm	Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	80.6	108.9			24.6	24.6		25.5	25.5			
Effective Green, g (s)	80.6	108.9			24.6	24.6		25.5	25.5			
Actuated g/C Ratio	0.56	0.76			0.17	0.17		0.18	0.18			
Clearance Time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	2.0	5.1			5.1	5.1		0.2	0.2			
Lane Grp Cap (vph)	994	2686			607	271		901	281			
v/s Ratio Prot	c0.56	0.29			c0.14			c0.16				
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.99	0.38			0.82	0.42		0.90	0.03			
Uniform Delay, d1	31.2	5.8			57.3	53.1		57.7	48.8			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	26.6	0.2			9.9	2.3		11.2	0.0			
Delay (s)	57.8	6.0			67.2	55.4		68.9	48.8			
Level of Service	E	A			E	E		E	D			
Approach Delay (s)		31.6			64.2			68.3			0.0	
Approach LOS		C			E			E			A	
Intersection Summary												
HCM Average Control Delay			46.5				HCM Level of Service		D			
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			143.5				Sum of lost time (s)		12.8			
Intersection Capacity Utilization			103.2%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

75: E Belmont Ave. & N Abby St





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			  				
Volume (vph)	422	1610	0	0	1540	302	62	1584	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	0.95			0.95	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		5076	1583			
Flt Permitted	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		5076	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	459	1750	0	0	1674	328	67	1722	32	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	12	0	0	10	0	0	0
Lane Group Flow (vph)	459	1750	0	0	1674	316	0	1789	22	0	0	0
Turn Type	Prot					Perm	Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases						8			2			
Actuated Green, G (s)	28.3	86.8			54.8	54.8		44.1	44.1			
Effective Green, g (s)	28.3	86.8			54.8	54.8		44.1	44.1			
Actuated g/C Ratio	0.20	0.62			0.39	0.39		0.32	0.32			
Clearance Time (s)	3.7	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	2.0	5.1			5.1	5.1		0.2	0.2			
Lane Grp Cap (vph)	358	2194			1385	620		1599	499			
v/s Ratio Prot	c0.26	0.49			c0.47			c0.35				
v/s Ratio Perm						0.20			0.01			
v/c Ratio	1.28	0.80			1.21	0.51		1.12	0.04			
Uniform Delay, d1	55.9	20.0			42.6	32.4		48.0	33.3			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	146.7	2.4			100.9	1.4		62.5	0.0			
Delay (s)	202.6	22.4			143.5	33.8		110.5	33.3			
Level of Service	F	C			F	C		F	C			
Approach Delay (s)		59.9			125.5			109.1			0.0	
Approach LOS		E			F			F			A	
Intersection Summary												
HCM Average Control Delay			96.5				HCM Level of Service		F			
HCM Volume to Capacity ratio			1.19									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		12.8			
Intersection Capacity Utilization			129.5%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

76: Fresno St. &





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	688	144	404	510	38	70	183	98	68	353	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.99		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3447		1770	3503		1770	3354		1770	3463	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3447		1770	3503		1770	3354		1770	3463	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	748	157	439	554	41	76	199	107	74	384	64
RTOR Reduction (vph)	0	11	0	0	3	0	0	56	0	0	10	0
Lane Group Flow (vph)	60	894	0	439	592	0	76	250	0	74	438	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	9.3	37.7		36.2	64.6		9.3	16.9		9.3	26.9	
Effective Green, g (s)	9.3	37.7		36.2	64.6		9.3	16.9		9.3	26.9	
Actuated g/C Ratio	0.07	0.30		0.28	0.51		0.07	0.13		0.07	0.21	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	129	1021		503	1778		129	445		129	732	
v/s Ratio Prot	0.03	c0.26		c0.25	0.17		c0.04	0.07		0.04	c0.13	
v/s Ratio Perm												
v/c Ratio	0.47	0.88		0.87	0.33		0.59	0.56		0.57	0.60	
Uniform Delay, d1	56.6	42.6		43.4	18.6		57.1	51.7		57.1	45.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	9.2		14.9	0.2		4.4	2.7		3.8	2.0	
Delay (s)	57.6	51.8		58.3	18.8		61.5	54.4		60.9	47.3	
Level of Service	E	D		E	B		E	D		E	D	
Approach Delay (s)		52.1			35.6			55.8			49.2	
Approach LOS		D			D			E			D	
Intersection Summary												
HCM Average Control Delay			46.2			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			127.3			Sum of lost time (s)			17.2			
Intersection Capacity Utilization			86.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

76: Fresno St. &























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	1327	109	178	1298	145	172	647	203	452	709	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3499		1770	3486		1770	3412		1770	3351	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3499		1770	3486		1770	3412		1770	3351	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	132	1442	118	193	1411	158	187	703	221	491	771	425
RTOR Reduction (vph)	0	4	0	0	6	0	0	21	0	0	52	0
Lane Group Flow (vph)	132	1556	0	193	1563	0	187	903	0	491	1144	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.0	43.4		13.0	44.4		15.0	36.4		25.0	56.4	
Effective Green, g (s)	12.0	43.4		13.0	44.4		15.0	36.4		25.0	56.4	
Actuated g/C Ratio	0.08	0.30		0.09	0.31		0.10	0.25		0.17	0.39	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	14.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	146	1047		159	1067		183	857		305	1303	
v/s Ratio Prot	0.07	0.44		c0.11	c0.45		0.11	0.26		c0.28	c0.34	
v/s Ratio Perm												
v/c Ratio	0.90	1.49		1.21	1.47		1.02	1.05		1.61	0.88	
Uniform Delay, d1	65.9	50.8		66.0	50.3		65.0	54.3		60.0	41.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	46.1	223.8		140.3	214.6		72.4	45.9		289.2	7.6	
Delay (s)	112.0	274.6		206.3	264.9		137.4	100.2		349.2	48.7	
Level of Service	F	F		F	F		F	F		F	D	
Approach Delay (s)		261.9			258.4			106.4			136.1	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			199.4			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			122.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

77: Belmont Street & First Street























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	495	215	154	644	114	284	462	55	101	638	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3459		1770	3483		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3459		1770	3483		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	145	538	234	167	700	124	309	502	60	110	693	176
RTOR Reduction (vph)	0	0	132	0	15	0	0	9	0	0	0	91
Lane Group Flow (vph)	145	538	102	167	809	0	309	553	0	110	693	85
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4									2
Actuated Green, G (s)	12.0	25.0	25.0	12.0	25.0		15.0	30.8		9.5	25.3	25.3
Effective Green, g (s)	12.0	25.0	25.0	12.0	25.0		15.0	30.8		9.5	25.3	25.3
Actuated g/C Ratio	0.13	0.26	0.26	0.13	0.26		0.16	0.32		0.10	0.27	0.27
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)	223	930	416	223	909		279	1128		177	942	421
v/s Ratio Prot	0.08	0.15		c0.09	c0.23		c0.17	0.16		0.06	c0.20	
v/s Ratio Perm			0.06									0.05
v/c Ratio	0.65	0.58	0.25	0.75	0.89		1.11	0.49		0.62	0.74	0.20
Uniform Delay, d1	39.6	30.5	27.6	40.1	33.7		40.0	25.8		41.1	31.8	27.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	1.2	0.5	11.4	11.1		85.8	0.7		4.8	3.7	0.5
Delay (s)	44.6	31.7	28.2	51.5	44.9		125.9	26.5		45.9	35.5	27.6
Level of Service	D	C	C	D	D		F	C		D	D	C
Approach Delay (s)		32.8			46.0			61.8			35.2	
Approach LOS		C			D			E			D	
Intersection Summary												
HCM Average Control Delay			43.6			HCM Level of Service					D	
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			95.1			Sum of lost time (s)				17.8		
Intersection Capacity Utilization			79.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

77: Belmont Street & First Street











4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	1336	437	167	1019	167	442	918	98	209	801	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3464		1770	3488		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3464		1770	3488		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	1452	475	182	1108	182	480	998	107	227	871	287
RTOR Reduction (vph)	0	0	63	0	9	0	0	5	0	0	0	75
Lane Group Flow (vph)	326	1452	412	182	1281	0	480	1100	0	227	871	212
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4									2
Actuated Green, G (s)	22.0	55.1	55.1	12.0	45.1		31.0	47.1		18.0	34.1	34.1
Effective Green, g (s)	22.0	55.1	55.1	12.0	45.1		31.0	47.1		18.0	34.1	34.1
Actuated g/C Ratio	0.15	0.37	0.37	0.08	0.30		0.21	0.31		0.12	0.23	0.23
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9		4.0	4.9		4.0	4.9	4.9
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	5.0		2.0	5.0	5.0
Lane Grp Cap (vph)	260	1300	581	142	1042		366	1095		212	805	360
v/s Ratio Prot	c0.18	0.41		0.10	c0.37		c0.27	0.32		0.13	c0.25	
v/s Ratio Perm			0.26									0.13
v/c Ratio	1.25	1.12	0.71	1.28	1.23		1.31	1.00		1.07	1.08	0.59
Uniform Delay, d1	64.0	47.5	40.6	69.0	52.5		59.5	51.5		66.0	58.0	51.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	141.8	63.6	4.5	169.8	111.7		158.5	28.2		81.8	56.2	3.8
Delay (s)	205.8	111.0	45.1	238.8	164.2		218.0	79.6		147.8	114.2	55.5
Level of Service	F	F	D	F	F		F	E		F	F	E
Approach Delay (s)		110.8			173.4			121.5			107.5	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			126.4			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.22									
Actuated Cycle Length (s)			150.0							17.8		
Intersection Capacity Utilization			111.6%							H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

78: CA 180 EB & N Blackstone Ave









4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						  
Volume (vph)	168	0	0	0	271	1880
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.2					4.9
Lane Util. Factor	1.00					0.91
Frt	1.00					1.00
Flt Protected	0.95					0.99
Satd. Flow (prot)	1770					5053
Flt Permitted	0.95					0.99
Satd. Flow (perm)	1770					5053
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	0	0	0	295	2043
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	183	0	0	0	0	2338
Turn Type					Split	
Protected Phases	8				6	6
Permitted Phases						
Actuated Green, G (s)	9.8					30.7
Effective Green, g (s)	9.8					30.7
Actuated g/C Ratio	0.20					0.62
Clearance Time (s)	4.2					4.9
Vehicle Extension (s)	4.8					5.4
Lane Grp Cap (vph)	350					3128
v/s Ratio Prot	c0.10					c0.46
v/s Ratio Perm						
v/c Ratio	0.52					0.75
Uniform Delay, d1	17.8					6.7
Progression Factor	1.00					1.00
Incremental Delay, d2	2.5					1.3
Delay (s)	20.3					8.0
Level of Service	C					A
Approach Delay (s)	20.3		0.0			8.0
Approach LOS	C		A			A
Intersection Summary						
HCM Average Control Delay			8.9		HCM Level of Service	A
HCM Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			49.6		Sum of lost time (s)	9.1
Intersection Capacity Utilization			152.9%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

78: CA 180 EB & N Blackstone Ave





















4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	102	0	0	0	504	2517
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	4.2					4.9
Lane Util. Factor	1.00					0.91
Frt	1.00					1.00
Flt Protected	0.95					0.99
Satd. Flow (prot)	1770					5043
Flt Permitted	0.95					0.99
Satd. Flow (perm)	1770					5043
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	0	0	0	548	2736
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	111	0	0	0	0	3284
Turn Type					Split	
Protected Phases	8				6	6
Permitted Phases						
Actuated Green, G (s)	10.0					60.5
Effective Green, g (s)	10.0					60.5
Actuated g/C Ratio	0.13					0.76
Clearance Time (s)	4.2					4.9
Vehicle Extension (s)	4.8					5.4
Lane Grp Cap (vph)	222					3833
v/s Ratio Prot	c0.06					c0.65
v/s Ratio Perm						
v/c Ratio	0.50					0.86
Uniform Delay, d1	32.5					6.6
Progression Factor	1.00					1.00
Incremental Delay, d2	3.4					2.3
Delay (s)	35.9					8.9
Level of Service	D					A
Approach Delay (s)	35.9		0.0			8.9
Approach LOS	D		A			A
Intersection Summary						
HCM Average Control Delay			9.8		HCM Level of Service	A
HCM Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			79.6		Sum of lost time (s)	9.1
Intersection Capacity Utilization			178.8%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

79: CA 180 EB & N Abby St





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	7	272	0	0	169	489	2	633	1116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	1863			1863	1583		5085	1583			
Flt Permitted	0.48	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	890	1863			1863	1583		5085	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	296	0	0	184	532	2	688	1213	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	242	0	0	54	0	0	0
Lane Group Flow (vph)	8	296	0	0	184	290	0	690	1159	0	0	0
Turn Type	Perm						Perm	Split		Perm		
Protected Phases								2	2			
Permitted Phases	4						4			2		
Actuated Green, G (s)	25.4	25.4			25.4	25.4		84.7	84.7			
Effective Green, g (s)	25.4	25.4			25.4	25.4		84.7	84.7			
Actuated g/C Ratio	0.21	0.21			0.21	0.21		0.71	0.71			
Clearance Time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	5.7	5.7			5.7	5.7		5.2	5.2			
Lane Grp Cap (vph)	190	397			397	337		3613	1125			
v/s Ratio Prot		0.16			0.10			0.14				
v/s Ratio Perm	0.01					c0.18			c0.73			
v/c Ratio	0.04	0.75			0.46	0.86		0.19	1.03			
Uniform Delay, d1	37.2	43.9			41.0	45.2		5.8	17.2			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.2	9.6			2.2	21.2		0.1	35.0			
Delay (s)	37.5	53.5			43.2	66.4		5.8	52.2			
Level of Service	D	D			D	E		A	D			
Approach Delay (s)		53.0			60.4			35.4			0.0	
Approach LOS		D			E			D			A	
Intersection Summary												
HCM Average Control Delay			43.4				HCM Level of Service		D			
HCM Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			119.2				Sum of lost time (s)		9.1			
Intersection Capacity Utilization			139.0%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

79: CA 180 EB & N Abby St



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  				
Volume (vph)	23	480	0	0	102	581	0	1180	1168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Lane Util. Factor	1.00	1.00			1.00	1.00		0.91	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	1863			1863	1583		5085	1583			
Flt Permitted	0.66	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	1225	1863			1863	1583		5085	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	522	0	0	111	632	0	1283	1270	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	46	0	0	0
Lane Group Flow (vph)	25	522	0	0	111	585	0	1283	1224	0	0	0
Turn Type	Perm						Perm	Split	Perm			
Protected Phases								2	2			
Permitted Phases	4						4			2		
Actuated Green, G (s)	40.8	40.8			40.8	40.8		80.1	80.1			
Effective Green, g (s)	40.8	40.8			40.8	40.8		80.1	80.1			
Actuated g/C Ratio	0.31	0.31			0.31	0.31		0.62	0.62			
Clearance Time (s)	4.2	4.2			4.2	4.2		4.9	4.9			
Vehicle Extension (s)	5.7	5.7			5.7	5.7		5.2	5.2			
Lane Grp Cap (vph)	384	585			585	497		3133	975			
v/s Ratio Prot		0.28			0.06			0.25				
v/s Ratio Perm	0.02					c0.37			c0.77			
v/c Ratio	0.07	0.89			0.19	1.18		0.41	1.25			
Uniform Delay, d1	31.2	42.5			32.5	44.6		12.8	25.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.2	17.2			0.4	99.3		0.2	123.2			
Delay (s)	31.4	59.7			33.0	143.9		13.0	148.1			
Level of Service	C	E			C	F		B	F			
Approach Delay (s)		58.4			127.3			80.2			0.0	
Approach LOS		E			F			F			A	
Intersection Summary												
HCM Average Control Delay			86.2				HCM Level of Service		F			
HCM Volume to Capacity ratio			1.23									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		9.1			
Intersection Capacity Utilization			165.0%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

80: CA 180 WB & N Blackstone Ave



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (vph)	0	415	1195	5	146	0	0	0	0	3	928	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	4.9
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frt		0.90		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1676		1770	1863						3539	1583
Flt Permitted		1.00		0.95	1.00						1.00	1.00
Satd. Flow (perm)		1676		1770	1863						3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	451	1299	5	159	0	0	0	0	3	1009	352
RTOR Reduction (vph)	0	62	0	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	1688	0	5	159	0	0	0	0	0	1012	182
Turn Type				Prot						Split		Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		90.0		2.2	95.9						35.5	35.5
Effective Green, g (s)		90.0		2.2	95.9						35.5	35.5
Actuated g/C Ratio		0.64		0.02	0.68						0.25	0.25
Clearance Time (s)		4.2		3.7	4.2						4.9	4.9
Vehicle Extension (s)		4.9		2.0	4.6						5.2	5.2
Lane Grp Cap (vph)		1074		28	1272						894	400
v/s Ratio Prot		c1.01		0.00	c0.09						c0.29	
v/s Ratio Perm												0.11
v/c Ratio		1.57		0.18	0.12						1.13	0.45
Uniform Delay, d1		25.2		68.3	7.7						52.5	44.3
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		261.9		1.1	0.1						73.4	1.8
Delay (s)		287.1		69.4	7.8						125.9	46.1
Level of Service		F		E	A						F	D
Approach Delay (s)		287.1			9.7			0.0			105.3	
Approach LOS		F			A			A			F	
Intersection Summary												
HCM Average Control Delay			197.6			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.43									
Actuated Cycle Length (s)			140.5			Sum of lost time (s)				13.3		
Intersection Capacity Utilization			128.7%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

80: CA 180 WB & N Blackstone Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (vph)	0	594	1161	20	303	0	0	0	0	5	1816	674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.2		3.7	4.2						4.9	4.9
Lane Util. Factor		1.00		1.00	1.00						0.95	1.00
Frt		0.91		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						1.00	1.00
Satd. Flow (prot)		1696		1770	1863						3539	1583
Flt Permitted		1.00		0.95	1.00						1.00	1.00
Satd. Flow (perm)		1696		1770	1863						3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	646	1262	22	329	0	0	0	0	5	1974	733
RTOR Reduction (vph)	0	45	0	0	0	0	0	0	0	0	0	183
Lane Group Flow (vph)	0	1863	0	22	329	0	0	0	0	0	1979	550
Turn Type				Prot						Split		Perm
Protected Phases		4		3	8					6	6	
Permitted Phases												6
Actuated Green, G (s)		76.0		6.9	86.6						49.5	49.5
Effective Green, g (s)		76.0		6.9	86.6						49.5	49.5
Actuated g/C Ratio		0.52		0.05	0.60						0.34	0.34
Clearance Time (s)		4.2		3.7	4.2						4.9	4.9
Vehicle Extension (s)		4.9		2.0	4.6						5.2	5.2
Lane Grp Cap (vph)		888		84	1111						1206	540
v/s Ratio Prot		c1.10		0.01	c0.18						c0.56	
v/s Ratio Perm												0.35
v/c Ratio		2.10		0.26	0.30						1.64	1.02
Uniform Delay, d1		34.6		66.7	14.4						47.8	47.8
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		497.8		0.6	0.3						292.2	43.7
Delay (s)		532.4		67.3	14.6						340.1	91.5
Level of Service		F		E	B						F	F
Approach Delay (s)		532.4			17.9			0.0			272.9	
Approach LOS		F			B			A			F	
Intersection Summary												
HCM Average Control Delay			354.5			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.84									
Actuated Cycle Length (s)			145.2			Sum of lost time (s)				13.3		
Intersection Capacity Utilization			160.5%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

81: Broadway St & Amador St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	7	562	17	57	49	32	1	37	29	17	24	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	611	18	62	53	35	1	40	32	18	26	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1300										
pX, platoon unblocked												
vC, conflicting volume	88			629			846	847	315	567	839	71
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			629			846	847	315	567	839	71
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			100	85	95	94	91	100
cM capacity (veh/h)	1506			949			224	276	681	326	279	977
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	313	324	150	73	48							
Volume Left	8	0	62	1	18							
Volume Right	0	18	35	32	3							
cSH	1506	1700	949	370	312							
Volume to Capacity	0.01	0.19	0.07	0.20	0.15							
Queue Length 95th (ft)	0	0	5	18	13							
Control Delay (s)	0.2	0.0	4.1	17.1	18.6							
Lane LOS	A		A	C	C							
Approach Delay (s)	0.1		4.1	17.1	18.6							
Approach LOS				C	C							
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			43.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

81: Broadway St & Amador St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	193	65	156	237	271	0	5	1624	1	276	1961	99
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	210	71	170	258	295	0	5	1765	1	300	2132	108
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1300										
pX, platoon unblocked												
vC, conflicting volume	295			240			2558	1385	120	2148	1470	295
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	295			240			2558	1385	120	2148	1470	295
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	83			81			0	0	100	0	0	85
cM capacity (veh/h)	1264			1324			0	96	909	0	85	702
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	245	205	552	1772	2539							
Volume Left	210	0	258	5	300							
Volume Right	0	170	0	1	108							
cSH	1264	1700	1324	0	0							
Volume to Capacity	0.17	0.12	0.19	Err	Err							
Queue Length 95th (ft)	15	0	18	Err	Err							
Control Delay (s)	7.4	0.0	5.0	Err	Err							
Lane LOS	A		A	F	F							
Approach Delay (s)	4.0		5.0	Err	Err							
Approach LOS				F	F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			263.4%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

82: Broadway St & San Joaquin St

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	26	540	45	20	117	35	0	59	32	55	71	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	587	49	22	127	38	0	64	35	60	77	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					1008							
pX, platoon unblocked												
vC, conflicting volume	165			636			914	877	318	607	882	146
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165			636			914	877	318	607	882	146
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			100	77	95	79	72	98
cM capacity (veh/h)	1410			943			169	273	678	287	271	874
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	322	342	187	99	154							
Volume Left	28	0	22	0	60							
Volume Right	0	49	38	35	17							
cSH	1410	1700	943	346	301							
Volume to Capacity	0.02	0.20	0.02	0.29	0.51							
Queue Length 95th (ft)	2	0	2	29	69							
Control Delay (s)	0.8	0.0	1.2	19.5	28.9							
Lane LOS	A		A	C	D							
Approach Delay (s)	0.4		1.2	19.5	28.9							
Approach LOS				C	D							
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			46.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

82: Broadway St & San Joaquin St























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	56	435	27	35	700	26	5	96	10	67	42	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	473	29	38	761	28	5	104	11	73	46	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					1008							
pX, platoon unblocked	0.81						0.81	0.81		0.81	0.81	0.81
vC, conflicting volume	789			502			1522	1474	251	1272	1475	775
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	618			502			1528	1468	251	1218	1469	601
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			96			83	0	99	0	50	89
cM capacity (veh/h)	772			1058			32	91	749	0	90	358
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	297	266	827	121	158							
Volume Left	61	0	38	5	73							
Volume Right	0	29	28	11	39							
cSH	772	1700	1058	90	0							
Volume to Capacity	0.08	0.16	0.04	1.34	Err							
Queue Length 95th (ft)	6	0	3	222	Err							
Control Delay (s)	2.8	0.0	0.9	292.8	Err							
Lane LOS	A		A	F	F							
Approach Delay (s)	1.5		0.9	292.8	Err							
Approach LOS				F	F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			79.6%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

83: F St & Fresno























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	11	46	36	89	12	1	77	1039	59	28	592	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	2049	1742	1947	2049	1742	1947	3862		1947	3887	
Flt Permitted	0.75	1.00	1.00	0.72	1.00	1.00	0.40	1.00		0.26	1.00	
Satd. Flow (perm)	1535	2049	1742	1484	2049	1742	830	3862		543	3887	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	50	39	97	13	1	84	1129	64	30	643	7
RTOR Reduction (vph)	0	0	30	0	0	1	0	9	0	0	2	0
Lane Group Flow (vph)	12	50	9	97	13	0	84	1184	0	30	648	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	7.4	7.4	7.4	7.4	7.4	7.4	15.1	15.1		15.1	15.1	
Effective Green, g (s)	7.4	7.4	7.4	7.4	7.4	7.4	15.1	15.1		15.1	15.1	
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.24	0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	372	497	423	360	497	423	411	1912		269	1924	
v/s Ratio Prot		0.02			0.01			c0.31			0.17	
v/s Ratio Perm	0.01		0.01	c0.07		0.00	0.10			0.06		
v/c Ratio	0.03	0.10	0.02	0.27	0.03	0.00	0.20	0.62		0.11	0.34	
Uniform Delay, d1	8.8	9.0	8.8	9.4	8.8	8.7	4.3	5.6		4.1	4.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.0	0.4	0.0	0.0	0.2	0.6		0.2	0.1	
Delay (s)	8.9	9.1	8.8	9.8	8.8	8.7	4.6	6.2		4.3	4.8	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		8.9			9.6			6.1			4.8	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay			6.0									
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			30.5									
Intersection Capacity Utilization			55.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

83: F St & Fresno

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	79	99	91	119	468	18	440	679	32	50	1370	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	2049	1742	1947	2049	1742	1947	3867		1947	3840	
Flt Permitted	0.29	1.00	1.00	0.69	1.00	1.00	0.25	1.00		0.31	1.00	
Satd. Flow (perm)	594	2049	1742	1408	2049	1742	509	3867		627	3840	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	108	99	129	509	20	478	738	35	54	1489	148
RTOR Reduction (vph)	0	0	4	0	0	13	0	8	0	0	18	0
Lane Group Flow (vph)	86	108	95	129	509	7	478	765	0	54	1619	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	13.8	13.8	13.8	13.8	13.8	13.8	16.1	16.1		16.1	16.1	
Effective Green, g (s)	13.8	13.8	13.8	13.8	13.8	13.8	16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	216	746	634	513	746	634	216	1643		266	1631	
v/s Ratio Prot		0.05			0.25			0.20			0.42	
v/s Ratio Perm	0.14		0.05	0.09		0.00	0.94			0.09		
v/c Ratio	0.40	0.14	0.15	0.25	0.68	0.01	2.21	0.47		0.20	0.99	
Uniform Delay, d1	9.0	8.1	8.1	8.4	10.2	7.7	10.9	7.8		6.9	10.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.1	0.1	0.3	2.6	0.0	560.6	0.2		0.4	20.5	
Delay (s)	10.2	8.2	8.2	8.7	12.8	7.7	571.5	8.0		7.2	31.3	
Level of Service	B	A	A	A	B	A	F	A		A	C	
Approach Delay (s)		8.8			11.8			223.3			30.5	
Approach LOS		A			B			F			C	
Intersection Summary												
HCM Average Control Delay			87.7			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.51									
Actuated Cycle Length (s)			37.9			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			108.9%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

84: G St & Mono Street

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	16	124	5	2	127	12	2	9	9	12	3	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	135	5	2	138	13	2	10	10	13	3	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1009			513							
pX, platoon unblocked												
vC, conflicting volume	151			140			333	328	138	336	324	145
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151			140			333	328	138	336	324	145
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	98	99	98	99	99
cM capacity (veh/h)	1430			1443			605	583	911	597	586	903
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	158	153	22	26								
Volume Left	17	2	2	13								
Volume Right	5	13	10	10								
cSH	1430	1443	699	682								
Volume to Capacity	0.01	0.00	0.03	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.9	0.1	10.3	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	0.1	10.3	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			27.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

84: G St & Mono Street

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	39	323	0	7	510	18	22	31	38	36	46	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	351	0	8	554	20	24	34	41	39	50	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1009			513							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	574			351			1079	1025	351	1073	1015	564
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	497			351			1044	985	351	1038	975	486
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			83	85	94	75	77	93
cM capacity (veh/h)	985			1208			141	218	692	154	221	536
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	393	582	99	128								
Volume Left	42	8	24	39								
Volume Right	0	20	41	39								
cSH	985	1208	258	232								
Volume to Capacity	0.04	0.01	0.38	0.55								
Queue Length 95th (ft)	3	0	43	75								
Control Delay (s)	1.4	0.2	27.4	38.2								
Lane LOS	A	A	D	E								
Approach Delay (s)	1.4	0.2	27.4	38.2								
Approach LOS			D	E								
Intersection Summary												
Average Delay			6.9									
Intersection Capacity Utilization			57.5%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

85: H St &

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	29	103	9	10	300	30	7	5	8	8	8	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	112	10	11	326	33	8	5	9	9	9	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		492										
pX, platoon unblocked												
vC, conflicting volume	359			122			579	560	117	555	549	342
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	359			122			579	560	117	555	549	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			98	99	99	98	98	96
cM capacity (veh/h)	1200			1466			391	422	935	423	429	700
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	153	370	22	48								
Volume Left	32	11	8	9								
Volume Right	10	33	9	30								
cSH	1200	1466	522	567								
Volume to Capacity	0.03	0.01	0.04	0.08								
Queue Length 95th (ft)	2	1	3	7								
Control Delay (s)	1.8	0.3	12.2	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.8	0.3	12.2	11.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			30.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

85: H St &



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	71	265	8	2	165	35	4	9	7	10	14	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	288	9	2	179	38	4	10	8	11	15	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		491										
pX, platoon unblocked												
vC, conflicting volume	217			297			668	668	292	662	654	198
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	217			297			668	668	292	662	654	198
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	97	99	97	96	99
cM capacity (veh/h)	1352			1265			339	357	747	347	364	843
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	374	220	22	37								
Volume Left	77	2	4	11								
Volume Right	9	38	8	11								
cSH	1352	1265	431	430								
Volume to Capacity	0.06	0.00	0.05	0.09								
Queue Length 95th (ft)	5	0	4	7								
Control Delay (s)	2.0	0.1	13.8	14.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	2.0	0.1	13.8	14.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			42.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

86: H St & Ventura Ave



















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	69	22	34	21	13	4	81	1058	11	7	762	247
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	24	37	23	14	4	88	1150	12	8	828	268
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								692			479	
pX, platoon unblocked	0.89	0.89	0.81	0.89	0.89	0.84	0.81			0.84		
vC, conflicting volume	1740	2316	548	1810	2444	581	1097			1162		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	760	1407	0	838	1551	110	645			804		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	78	96	86	84	99	88			99		
cM capacity (veh/h)	207	107	876	166	88	772	757			683		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	136	41	88	767	395	8	552	545				
Volume Left	75	23	88	0	0	8	0	0				
Volume Right	37	4	0	0	12	0	0	268				
cSH	217	135	757	1700	1700	683	1700	1700				
Volume to Capacity	0.63	0.30	0.12	0.45	0.23	0.01	0.32	0.32				
Queue Length 95th (ft)	92	30	10	0	0	1	0	0				
Control Delay (s)	46.0	42.8	10.4	0.0	0.0	10.3	0.0	0.0				
Lane LOS	E	E	B			B						
Approach Delay (s)	46.0	42.8	0.7			0.1						
Approach LOS	E	E										
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			52.1%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

86: H St & Ventura Ave


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	153	10	141	17	10	14	93	1119	18	2	1238	99
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	166	11	153	18	11	15	101	1216	20	2	1346	108
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		998										
pX, platoon unblocked												
vC, conflicting volume	26			164			1256	483	88	1103	552	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	26			164			1256	483	88	1103	552	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			99			0	0	98	0	0	90
cM capacity (veh/h)	1588			1414			0	427	971	0	390	1060
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3				
Volume Total	330	45	101	811	425	2	897	556				
Volume Left	166	18	101	0	0	2	0	0				
Volume Right	153	15	0	0	20	0	0	108				
cSH	1588	1414	0	427	438	0	390	444				
Volume to Capacity	0.10	0.01	Err	1.90	0.97	Err	2.30	1.25				
Queue Length 95th (ft)	9	1	Err	1341	296	Err	1707	576				
Control Delay (s)	4.2	3.2	Err	435.2	66.7	Err	614.9	157.7				
Lane LOS	A	A	F	F	F	F	F	F				
Approach Delay (s)	4.2	3.2	Err			Err						
Approach LOS			F			F						
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			76.8%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

87: O St & Sant Clara Street


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	54	30	0	377	0	0	0	0	225	102	608
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	59	33	0	410	0	0	0	0	245	111	661
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total (vph)	91	410	0	355	661							
Volume Left (vph)	0	0	0	245	0							
Volume Right (vph)	33	0	0	0	661							
Hadj (s)	-0.18	0.03	0.00	0.17	-0.57							
Departure Headway (s)	5.4	5.1	5.9	5.4	3.2							
Degree Utilization, x	0.14	0.58	0.00	0.53	0.59							
Capacity (veh/h)	609	671	534	632	1118							
Control Delay (s)	9.2	15.0	8.9	14.4	10.6							
Approach Delay (s)	9.2	15.0	0.0	12.0								
Approach LOS	A	C	A	B								
Intersection Summary												
Delay			12.6									
HCM Level of Service			B									
Intersection Capacity Utilization			64.2%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

87: O St & Santa Clara Street

















4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	532	0	0	339	81	0	0	11	316	27	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	578	0	0	368	88	0	0	12	343	29	147
Direction, Lane #	NB 1	SB 1	NE 1	SW 1	SW 2							
Volume Total (vph)	578	457	12	373	147							
Volume Left (vph)	0	0	0	343	0							
Volume Right (vph)	0	88	12	0	147							
Hadj (s)	0.03	-0.08	-0.57	0.22	-0.57							
Departure Headway (s)	6.4	6.4	7.9	7.0	3.2							
Degree Utilization, x	1.02	0.81	0.03	0.73	0.13							
Capacity (veh/h)	568	557	396	373	1121							
Control Delay (s)	69.3	31.0	11.1	26.7	6.7							
Approach Delay (s)	69.3	31.0	11.1	21.0								
Approach LOS	F	D	B	C								
Intersection Summary												
Delay			41.7									
HCM Level of Service			E									
Intersection Capacity Utilization			55.0%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

89: M St &

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	196	211	0	0	0	171	0	108	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	213	229	0	0	0	186	0	117	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			229			748	655	115	611	655	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			229			748	655	115	611	655	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			100			100	65	99	100	100	100
cM capacity (veh/h)	1622			1336			271	333	916	245	333	1084
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NE 1	NE 2						
Volume Total	213	115	115	186	78	51						
Volume Left	213	0	0	0	0	0						
Volume Right	0	0	0	186	0	12						
cSH	1622	1700	1700	1700	333	392						
Volume to Capacity	0.13	0.07	0.07	0.11	0.23	0.13						
Queue Length 95th (ft)	11	0	0	0	22	11						
Control Delay (s)	7.6	0.0	0.0	0.0	19.1	15.6						
Lane LOS	A				C	C						
Approach Delay (s)	3.6			0.0	17.7							
Approach LOS					C							
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			34.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

89: M St &

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	853	497	0	0	0	251	0	170	117	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	927	540	0	0	0	273	0	185	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			540			2531	2395	270	2344	2395	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			540			2531	2395	270	2344	2395	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	43			100			100	0	83	0	100	100
cM capacity (veh/h)	1622			1024			8	14	728	0	14	1084
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NE 1	NE 2						
Volume Total	927	270	270	273	123	189						
Volume Left	927	0	0	0	0	0						
Volume Right	0	0	0	273	0	127						
cSH	1622	1700	1700	1700	14	42						
Volume to Capacity	0.57	0.16	0.16	0.16	8.67	4.51						
Queue Length 95th (ft)	96	0	0	0	Err	Err						
Control Delay (s)	10.1	0.0	0.0	0.0	Err	Err						
Lane LOS	B				F	F						
Approach Delay (s)	6.4			0.0	Err							
Approach LOS					F							
Intersection Summary												
Average Delay			1524.6									
Intersection Capacity Utilization			74.5%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

90: Broadway St & Santa Clara Street

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	141	242	10	5	62	35	6	4	18	36	18	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	153	263	11	5	67	38	7	4	20	39	20	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		488										
pX, platoon unblocked												
vC, conflicting volume	105			274			715	691	137	557	678	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	105			274			715	691	137	557	678	86
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			98	99	98	89	94	97
cM capacity (veh/h)	1484			1286			270	327	886	367	333	955
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	285	142	111	30	91							
Volume Left	153	0	5	7	39							
Volume Right	0	11	38	20	33							
cSH	1484	1700	1286	511	458							
Volume to Capacity	0.10	0.08	0.00	0.06	0.20							
Queue Length 95th (ft)	9	0	0	5	18							
Control Delay (s)	4.5	0.0	0.4	12.5	14.8							
Lane LOS	A		A	B	B							
Approach Delay (s)	3.0		0.4	12.5	14.8							
Approach LOS				B	B							
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			30.0%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

90: Broadway St & Santa Clara Street


















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	34	357	0	7	280	35	4	3	5	16	31	73
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	388	0	8	304	38	4	3	5	17	34	79
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		477										
pX, platoon unblocked												
vC, conflicting volume	342			388			897	820	194	614	801	323
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	342			388			897	820	194	614	801	323
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			98	99	99	95	89	88
cM capacity (veh/h)	1213			1167			184	297	815	360	305	672
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1							
Volume Total	231	194	350	13	130							
Volume Left	37	0	8	4	17							
Volume Right	0	0	38	5	79							
cSH	1213	1700	1167	316	471							
Volume to Capacity	0.03	0.11	0.01	0.04	0.28							
Queue Length 95th (ft)	2	0	0	3	28							
Control Delay (s)	1.5	0.0	0.2	16.9	15.5							
Lane LOS	A		A	C	C							
Approach Delay (s)	0.8		0.2	16.9	15.5							
Approach LOS				C	C							
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			39.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

91: E Hamilton Ave & Van Ness Ave


















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	2	4	6	0	23	5	96	8	79	171	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	2	4	7	0	25	5	104	9	86	186	46
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	10	7	25	118	317							
Volume Left (vph)	3	7	0	5	86							
Volume Right (vph)	4	0	25	9	46							
Hadj (s)	-0.17	0.23	-0.57	0.00	0.00							
Departure Headway (s)	4.7	5.1	3.2	4.2	4.1							
Degree Utilization, x	0.01	0.01	0.02	0.14	0.36							
Capacity (veh/h)	696	643	1121	827	878							
Control Delay (s)	7.7	8.1	6.3	7.9	9.3							
Approach Delay (s)	7.7	6.7		7.9	9.3							
Approach LOS	A	A		A	A							
Intersection Summary												
Delay			8.8									
HCM Level of Service			A									
Intersection Capacity Utilization			32.6%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

91: E Hamilton Ave & Van Ness Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	17	4	2	44	1	77	11	273	35	44	335	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	4	2	48	1	84	12	297	38	48	364	15
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	25	49	84	347	427							
Volume Left (vph)	18	48	0	12	48							
Volume Right (vph)	2	0	84	38	15							
Hadj (s)	0.13	0.23	-0.57	-0.02	0.04							
Departure Headway (s)	5.9	5.9	3.2	4.6	4.6							
Degree Utilization, x	0.04	0.08	0.07	0.44	0.54							
Capacity (veh/h)	526	529	1121	764	770							
Control Delay (s)	9.1	9.4	6.5	11.1	12.8							
Approach Delay (s)	9.1	7.6		11.1	12.8							
Approach LOS	A	A		B	B							
Intersection Summary												
Delay			11.3									
HCM Level of Service			B									
Intersection Capacity Utilization			52.3%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

92: E California Ave & Van Ness Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	360	70	15	284	25	31	100	16	25	140	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	391	76	16	309	27	34	109	17	27	152	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	589	416	168	679	424	117	185			126		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	589	416	168	679	424	117	185			126		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	22	91	86	38	97	98			98		
cM capacity (veh/h)	201	505	876	117	500	935	1390			1460		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	490	352	160	212								
Volume Left	23	16	34	27								
Volume Right	76	27	17	33								
cSH	502	448	1390	1460								
Volume to Capacity	0.98	0.79	0.02	0.02								
Queue Length 95th (ft)	321	174	2	1								
Control Delay (s)	63.1	36.7	1.8	1.1								
Lane LOS	F	E	A	A								
Approach Delay (s)	63.1	36.7	1.8	1.1								
Approach LOS	F	E										
Intersection Summary												
Average Delay			36.6									
Intersection Capacity Utilization			50.2%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

92: E California Ave & Van Ness Ave










4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	142	538	60	92	474	43	113	132	171	97	222	60
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	585	65	100	515	47	123	143	186	105	241	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1271	1060	274	1324	999	236	307			329		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1271	1060	274	1324	999	236	307			329		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	91	0	0	94	90			91		
cM capacity (veh/h)	0	185	765	0	201	803	1254			1230		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	804	662	452	412								
Volume Left	154	100	123	105								
Volume Right	65	47	186	65								
cSH	0	0	1254	1230								
Volume to Capacity	Err	Err	0.10	0.09								
Queue Length 95th (ft)	Err	Err	8	7								
Control Delay (s)	Err	Err	2.9	2.7								
Lane LOS	F	F	A	A								
Approach Delay (s)	Err	Err	2.9	2.7								
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			96.8%		ICU Level of Service					F		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

93: S Railroad Ave & E Lorena Ave










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	82	1	2	76	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	1	2	83	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			90		177	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		177	90
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1505		812	968
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	90	85	0			
Volume Left	0	2	0			
Volume Right	1	0	0			
cSH	1700	1505	1700			
Volume to Capacity	0.05	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.2	0.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.2	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			8.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

93: S Railroad Ave & E Lorena Ave










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	125	3	5	161	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	3	5	175	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			139		323	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			139		323	138
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1444		668	911
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	139	180	2			
Volume Left	0	5	2			
Volume Right	3	0	0			
cSH	1700	1444	668			
Volume to Capacity	0.08	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.3	10.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.3	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			22.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

94: Van Ness Ave & S Railroad Ave










4/25/2011

						
Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	114	47	33	50	31	87
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	124	51	36	54	34	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	207	81	128			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	207	81	128			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	95	98			
cM capacity (veh/h)	762	979	1458			
Direction, Lane #	WB 1	SE 1	NW 1			
Volume Total	175	90	128			
Volume Left	124	36	0			
Volume Right	51	0	95			
cSH	815	1458	1700			
Volume to Capacity	0.21	0.02	0.08			
Queue Length 95th (ft)	20	2	0			
Control Delay (s)	10.6	3.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.6	3.1	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utilization			27.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

94: Van Ness Ave & S Railroad Ave

















4/25/2011

						
Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	305	75	65	62	75	339
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	332	82	71	67	82	368
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	474	266	450			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	474	266	450			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	35	89	94			
cM capacity (veh/h)	514	773	1110			
Direction, Lane #	WB 1	SE 1	NW 1			
Volume Total	413	138	450			
Volume Left	332	71	0			
Volume Right	82	0	368			
cSH	550	1110	1700			
Volume to Capacity	0.75	0.06	0.26			
Queue Length 95th (ft)	163	5	0			
Control Delay (s)	28.6	4.6	0.0			
Lane LOS	D	A				
Approach Delay (s)	28.6	4.6	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			12.5			
Intersection Capacity Utilization			63.2%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

95: S Railroad Ave & E. Florence Ave

















4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	27	109	17	0	89	22	9	0	2	11	4	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	118	18	0	97	24	10	0	2	12	4	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	121			137			317	307	128	297	304	109
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	121			137			317	307	128	297	304	109
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	100	98	99	98
cM capacity (veh/h)	1467			1447			610	595	922	643	597	945
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	166	121	12	36								
Volume Left	29	0	10	12								
Volume Right	18	24	2	20								
cSH	1467	1447	650	770								
Volume to Capacity	0.02	0.00	0.02	0.05								
Queue Length 95th (ft)	2	0	1	4								
Control Delay (s)	1.5	0.0	10.6	9.9								
Lane LOS	A		B	A								
Approach Delay (s)	1.5	0.0	10.6	9.9								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			24.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

95: S Railroad Ave & E. Florence Ave























4/25/2011

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	5	355	16	5	340	9	18	2	0	14	0	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	386	17	5	370	10	20	2	0	15	0	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	379			403			848	796	395	792	799	374
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	379			403			848	796	395	792	799	374
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			92	99	100	95	100	91
cM capacity (veh/h)	1179			1155			255	317	655	303	315	672
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	409	385	22	73								
Volume Left	5	5	20	15								
Volume Right	17	10	0	58								
cSH	1179	1155	260	536								
Volume to Capacity	0.00	0.00	0.08	0.14								
Queue Length 95th (ft)	0	0	7	12								
Control Delay (s)	0.2	0.2	20.1	12.8								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.2	0.2	20.1	12.8								
Approach LOS			C	B								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			32.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

96: E Church Ave & Golden State Blvd























4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	135	543	420	151	445	395	447	1113	156	268	946	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	3893	1742	1947	2049	1742	1947	3821		1947	3849	
Flt Permitted	0.25	1.00	1.00	0.29	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	512	3893	1742	595	2049	1742	1947	3821		1947	3849	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	590	457	164	484	429	486	1210	170	291	1028	84
RTOR Reduction (vph)	0	0	291	0	0	315	0	18	0	0	10	0
Lane Group Flow (vph)	147	590	166	164	484	114	486	1362	0	291	1102	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4						
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	15.0	22.0		10.0	17.0	
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0	16.0	15.0	22.0		10.0	17.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.25	0.37		0.17	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	1038	465	159	546	465	487	1401		325	1091	
w/s Ratio Prot		0.15			0.24		c0.25	c0.36		0.15	0.29	
w/s Ratio Perm	c0.29		0.10	0.28		0.07						
w/c Ratio	1.07	0.57	0.36	1.03	0.89	0.25	1.00	0.97		0.90	1.01	
Uniform Delay, d1	22.0	19.0	17.8	22.0	21.1	17.3	22.5	18.7		24.5	21.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	97.7	0.7	0.5	79.9	15.9	0.3	40.0	17.7		25.4	29.7	
Delay (s)	119.7	19.7	18.3	101.9	37.0	17.5	62.4	36.4		49.9	51.2	
Level of Service	F	B	B	F	D	B	E	D		D	D	
Approach Delay (s)		31.5			39.1			43.1			51.0	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay			41.8				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			97.6%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

96: E Church Ave & Golden State Blvd





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	184	615	366	224	825	550	549	1463	176	494	1097	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	3893	1742	1947	2049	1742	1947	3831		1947	3837	
Flt Permitted	0.15	1.00	1.00	0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	315	3893	1742	606	2049	1742	1947	3831		1947	3837	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	668	398	243	897	598	597	1590	191	537	1192	128
RTOR Reduction (vph)	0	0	200	0	0	202	0	13	0	0	12	0
Lane Group Flow (vph)	200	668	198	243	897	396	597	1768	0	537	1308	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4		4	4		4						
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0	26.0	10.0	23.0		9.0	22.0	
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0	26.0	10.0	23.0		9.0	22.0	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.14	0.33		0.13	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	117	1446	647	225	761	647	278	1259		250	1206	
v/s Ratio Prot		0.17			0.44		c0.31	c0.46		0.28	0.34	
v/s Ratio Perm	c0.63		0.11	0.40		0.23						
v/c Ratio	1.71	0.46	0.31	1.08	1.18	0.61	2.15	1.40		2.15	1.08	
Uniform Delay, d1	22.0	16.7	15.6	22.0	22.0	17.9	30.0	23.5		30.5	24.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	352.8	0.2	0.3	82.9	93.8	1.7	528.2	186.6		529.7	52.2	
Delay (s)	374.8	16.9	15.9	104.9	115.8	19.6	558.2	210.1		560.2	76.2	
Level of Service	F	B	B	F	F	B	F	F		F	E	
Approach Delay (s)		73.1			81.2			297.5			216.1	
Approach LOS		E			F			F			F	
Intersection Summary												
HCM Average Control Delay			185.5			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.58									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			140.4%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

97: E Chruch Ave & S Railroad Ave





















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	29	1016	43	153	980	14	20	71	30	7	55	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	3869		1947	3885		1947	1957		1947	1835	
Flt Permitted	0.23	1.00		0.21	1.00		0.55	1.00		0.69	1.00	
Satd. Flow (perm)	479	3869		435	3885		1135	1957		1406	1835	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	1104	47	166	1065	15	22	77	33	8	60	138
RTOR Reduction (vph)	0	4	0	0	1	0	0	27	0	0	78	0
Lane Group Flow (vph)	32	1147	0	166	1079	0	22	83	0	8	120	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)	33.6	33.6		33.6	33.6		9.1	9.1		9.1	9.1	
Effective Green, g (s)	33.6	33.6		33.6	33.6		9.1	9.1		9.1	9.1	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	317	2564		288	2575		204	351		252	329	
v/s Ratio Prot		0.30			0.28			0.04			c0.07	
v/s Ratio Perm	0.07			c0.38			0.02			0.01		
v/c Ratio	0.10	0.45		0.58	0.42		0.11	0.24		0.03	0.36	
Uniform Delay, d1	3.1	4.1		4.7	4.0		17.4	17.8		17.2	18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		2.8	0.1		0.2	0.3		0.1	0.7	
Delay (s)	3.2	4.2		7.4	4.1		17.6	18.2		17.2	19.0	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		4.2			4.5			18.1			18.9	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay			6.1			HCM Level of Service			A			
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			50.7			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			64.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

97: E Chruch Ave & S Railroad Ave











4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	35	1228	18	272	1428	64	72	256	43	125	254	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1947	3885		1947	3868		1947	2005		1947	1921	
Flt Permitted	0.09	1.00		0.15	1.00		0.25	1.00		0.29	1.00	
Satd. Flow (perm)	193	3885		306	3868		512	2005		585	1921	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	1335	20	296	1552	70	78	278	47	136	276	197
RTOR Reduction (vph)	0	1	0	0	4	0	0	8	0	0	37	0
Lane Group Flow (vph)	38	1354	0	296	1618	0	78	317	0	136	436	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			2			1			1		
Permitted Phases	2			2			1			1		
Actuated Green, G (s)	46.0	46.0		46.0	46.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	46.0	46.0		46.0	46.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	2553		201	2542		117	458		134	439	
v/s Ratio Prot		0.35			0.42			0.16			0.23	
v/s Ratio Perm	0.20			c0.97			0.15			c0.23		
v/c Ratio	0.30	0.53		1.47	0.64		0.67	0.69		1.01	0.99	
Uniform Delay, d1	5.1	6.3		12.0	7.1		24.6	24.7		27.0	26.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.2		237.7	0.5		13.4	4.5		81.8	40.9	
Delay (s)	6.4	6.5		249.7	7.6		38.0	29.2		108.8	67.9	
Level of Service	A	A		F	A		D	C		F	E	
Approach Delay (s)		6.5			45.0			30.9			77.0	
Approach LOS		A			D			C			E	
Intersection Summary												
HCM Average Control Delay	35.8			HCM Level of Service			D					
HCM Volume to Capacity ratio	1.35											
Actuated Cycle Length (s)	70.0			Sum of lost time (s)			8.0					
Intersection Capacity Utilization	91.3%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

98: E Chruch Ave & S East Ave











4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	350	807	834	17	16	318
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	380	877	907	18	17	346
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		446				
pX, platoon unblocked					0.96	
vC, conflicting volume	925				2115	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	925				2079	462
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	48				18	37
cM capacity (veh/h)	734				21	546
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	380	439	439	604	321	363
Volume Left	380	0	0	0	0	17
Volume Right	0	0	0	0	18	346
cSH	734	1700	1700	1700	1700	251
Volume to Capacity	0.52	0.26	0.26	0.36	0.19	1.45
Queue Length 95th (ft)	75	0	0	0	0	516
Control Delay (s)	15.0	0.0	0.0	0.0	0.0	260.0
Lane LOS	C					F
Approach Delay (s)	4.6			0.0		260.0
Approach LOS						F
Intersection Summary						
Average Delay			39.3			
Intersection Capacity Utilization			73.5%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

98: E Chruch Ave & S East Ave

















4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	456	1018	1188	21	16	583
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	496	1107	1291	23	17	634
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		446				
pX, platoon unblocked					0.87	
vC, conflicting volume	1314				2847	657
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1314				2825	657
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	5				0	0
cM capacity (veh/h)	522				1	407
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	496	553	553	861	453	651
Volume Left	496	0	0	0	0	17
Volume Right	0	0	0	0	23	634
cSH	522	1700	1700	1700	1700	22
Volume to Capacity	0.95	0.33	0.33	0.51	0.27	29.50
Queue Length 95th (ft)	302	0	0	0	0	Err
Control Delay (s)	55.9	0.0	0.0	0.0	0.0	Err
Lane LOS	F					F
Approach Delay (s)	17.3			0.0		Err
Approach LOS						F
Intersection Summary						
Average Delay			1832.7			
Intersection Capacity Utilization			105.7%	ICU Level of Service		G
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

99: E Church Ave & S Sunland Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	773	43	21	802	2	33	1	4	0	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	840	47	23	872	2	36	1	4	0	0	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		715										
pX, platoon unblocked												
vC, conflicting volume	874			887			1370	1801	443	1361	1823	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874			887			1370	1801	443	1361	1823	437
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			64	99	99	100	100	99
cM capacity (veh/h)	768			759			101	76	562	102	73	567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	429	467	459	438	41	8						
Volume Left	9	0	23	0	36	0						
Volume Right	0	47	0	2	4	8						
cSH	768	1700	759	1700	109	567						
Volume to Capacity	0.01	0.27	0.03	0.26	0.38	0.01						
Queue Length 95th (ft)	1	0	2	0	39	1						
Control Delay (s)	0.3	0.0	0.9	0.0	56.8	11.4						
Lane LOS	A		A		F	B						
Approach Delay (s)	0.2		0.4		56.8	11.4						
Approach LOS					F	B						
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			52.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

99: E Church Ave & S Sunland Ave










4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	512	16	39	503	0	24	0	43	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	557	17	42	547	0	26	0	47	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	547			574			923	1197	287	957	1205	273
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	547			574			923	1197	287	957	1205	273
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			88	100	93	100	100	100
cM capacity (veh/h)	1019			995			217	177	710	192	175	724
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	278	296	316	273	73	0						
Volume Left	0	0	42	0	26	0						
Volume Right	0	17	0	0	47	0						
cSH	1019	1700	995	1700	392	1700						
Volume to Capacity	0.00	0.17	0.04	0.16	0.19	0.00						
Queue Length 95th (ft)	0	0	3	0	17	0						
Control Delay (s)	0.0	0.0	1.6	0.0	16.3	0.0						
Lane LOS			A		C	A						
Approach Delay (s)	0.0		0.8		16.3	0.0						
Approach LOS					C	A						
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			43.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

100: S East Ave & Railroad Ave










4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (veh/h)	60	98	108	126	29	144
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	107	117	137	32	157
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			674			
pX, platoon unblocked						
vC, conflicting volume	405	186			254	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405	186			254	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	88			98	
cM capacity (veh/h)	587	856			1311	
Direction, Lane #	EB 1	SE 1	NW 1			
Volume Total	172	254	188			
Volume Left	65	0	32			
Volume Right	107	137	0			
cSH	729	1700	1311			
Volume to Capacity	0.24	0.15	0.02			
Queue Length 95th (ft)	23	0	2			
Control Delay (s)	11.5	0.0	1.5			
Lane LOS	B		A			
Approach Delay (s)	11.5	0.0	1.5			
Approach LOS	B					
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			41.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

100: S East Ave &























4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (veh/h)	81	51	464	82	52	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	55	504	89	57	513
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			674			
pX, platoon unblocked	0.89	0.89			0.89	
vC, conflicting volume	1175	549			593	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1133	426			476	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	53	90			94	
cM capacity (veh/h)	187	557			962	
Direction, Lane #	EB 1	SE 1	NW 1			
Volume Total	143	593	570			
Volume Left	88	0	57			
Volume Right	55	89	0			
cSH	252	1700	962			
Volume to Capacity	0.57	0.35	0.06			
Queue Length 95th (ft)	80	0	5			
Control Delay (s)	36.7	0.0	1.6			
Lane LOS	E		A			
Approach Delay (s)	36.7	0.0	1.6			
Approach LOS	E					
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization			74.7%	ICU Level of Service		D
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

101: S East Ave & Golden State Blvd























4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	104	335	67	137	265	26	24	1336	342	116	1062	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1947	1998		1947	2022		1947	3893	1742	1947	3893	1742
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1947	1998		1947	2022		1947	3893	1742	1947	3893	1742
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	113	364	73	149	288	28	26	1452	372	126	1154	103
RTOR Reduction (vph)	0	10	0	0	5	0	0	0	218	0	0	52
Lane Group Flow (vph)	113	427	0	149	311	0	26	1452	154	126	1154	51
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	6.2	15.1		7.8	16.7		2.9	25.7	25.7	6.2	29.0	29.0
Effective Green, g (s)	6.2	15.1		7.8	16.7		2.9	25.7	25.7	6.2	29.0	29.0
Actuated g/C Ratio	0.09	0.21		0.11	0.24		0.04	0.36	0.36	0.09	0.41	0.41
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	171	426		215	477		80	1413	632	171	1595	714
v/s Ratio Prot	0.06	c0.21		c0.08	0.15		0.01	c0.37		c0.06	c0.30	
v/s Ratio Perm									0.09			0.03
v/c Ratio	0.66	1.00		0.69	0.65		0.33	1.03	0.24	0.74	0.72	0.07
Uniform Delay, d1	31.3	27.8		30.3	24.4		33.0	22.5	15.8	31.5	17.5	12.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.2	44.1		9.3	3.2		2.4	31.3	0.2	15.2	1.7	0.0
Delay (s)	40.5	71.9		39.6	27.6		35.4	53.8	16.0	46.7	19.2	12.8
Level of Service	D	E		D	C		D	D	B	D	B	B
Approach Delay (s)		65.4			31.5			45.9			21.2	
Approach LOS		E			C			D			C	
Intersection Summary												
HCM Average Control Delay			38.8			HCM Level of Service			D			
HCM Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			70.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			86.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

101: S East Ave & Golden State Blvd





















4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	65	25	29	49	37	6	1	1627	39	18	1992	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1947	1882		1947	2003		1947	3893	1742	1947	3893	1742
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1947	1882		1947	2003		1947	3893	1742	1947	3893	1742
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	27	32	53	40	7	1	1768	42	20	2165	38
RTOR Reduction (vph)	0	28	0	0	6	0	0	0	13	0	0	7
Lane Group Flow (vph)	71	31	0	53	41	0	1	1768	29	20	2165	31
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	5.9	9.5		4.3	7.9		1.0	43.6	43.6	2.5	45.1	45.1
Effective Green, g (s)	5.9	9.5		4.3	7.9		1.0	43.6	43.6	2.5	45.1	45.1
Actuated g/C Ratio	0.08	0.13		0.06	0.10		0.01	0.57	0.57	0.03	0.59	0.59
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	151	236		110	208		26	2236	1001	64	2313	1035
v/s Ratio Prot	c0.04	0.02		0.03	c0.02		0.00	0.45		c0.01	c0.56	
v/s Ratio Perm									0.02			0.02
v/c Ratio	0.47	0.13		0.48	0.20		0.04	0.79	0.03	0.31	0.94	0.03
Uniform Delay, d1	33.5	29.5		34.7	31.1		37.0	12.6	7.0	35.9	14.1	6.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.3		3.3	0.5		0.6	2.0	0.0	2.8	7.9	0.0
Delay (s)	35.8	29.8		38.0	31.6		37.6	14.6	7.0	38.6	22.0	6.4
Level of Service	D	C		D	C		D	B	A	D	C	A
Approach Delay (s)		33.1			35.0			14.4			21.9	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			19.4			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			75.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			72.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

102: E Jensen Ave & Golden State Blvd

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWL	NWT
Lane Configurations												
Volume (vph)	378	405	159	954	670	18	180	121	1365	412	254	1838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95			0.97	0.95		0.97	0.95
Frt	1.00	0.96		1.00	1.00			1.00	0.97		1.00	0.96
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3776	3728		3776	3878			3776	3758		3776	3748
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	3776	3728		3776	3878			3776	3758		3776	3748
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	411	440	173	1037	728	20	196	132	1484	448	276	1998
RTOR Reduction (vph)	0	28	0	0	2	0	0	0	19	0	0	21
Lane Group Flow (vph)	411	585	0	1037	746	0	0	328	1913	0	276	2640
Turn Type	Prot			Prot			Prot	Prot			Prot	
Protected Phases	3	8		7	4		5	5	2		1	6
Permitted Phases												
Actuated Green, G (s)	17.0	19.0		29.0	31.0			9.0	75.0		11.0	77.0
Effective Green, g (s)	17.0	19.0		29.0	31.0			9.0	75.0		11.0	77.0
Actuated g/C Ratio	0.11	0.13		0.19	0.21			0.06	0.50		0.07	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	428	472		730	801			227	1879		277	1924
v/s Ratio Prot	0.11	c0.16		c0.27	0.19			c0.09	0.51		0.07	c0.70
v/s Ratio Perm												
v/c Ratio	0.96	1.24		1.42	0.93			1.68dl	1.02		1.00	1.37
Uniform Delay, d1	66.2	65.5		60.5	58.5			70.5	37.5		69.5	36.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	33.3	124.8		197.2	17.4			223.3	25.4		52.7	170.7
Delay (s)	99.4	190.3		257.7	75.9			293.8	62.9		122.2	207.2
Level of Service	F	F		F	E			F	E		F	F
Approach Delay (s)		153.8			181.5				96.4			199.3
Approach LOS		F			F				F			F

Intersection Summary

HCM Average Control Delay	160.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	135.7%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 102: E Jensen Ave & Golden State Blvd

4/25/2011























Movement	NWR
Lane Configurations	
Volume (vph)	610
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	663
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

102: E Jensen Ave & Golden State Blvd

4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEU	SEL	SET	SER	NWL	NWT
Lane Configurations												
Volume (vph)	653	621	517	1124	914	32	281	115	1920	443	502	2388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95			0.97	0.95		0.97	0.95
Frt	1.00	0.93		1.00	0.99			1.00	0.97		1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	3776	3628		3776	3873			3776	3784		3776	3768
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	3776	3628		3776	3873			3776	3784		3776	3768
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	710	675	562	1222	993	35	305	125	2087	482	546	2596
RTOR Reduction (vph)	0	90	0	0	1	0	0	0	13	0	0	17
Lane Group Flow (vph)	710	1147	0	1222	1027	0	0	430	2556	0	546	3284
Turn Type	Prot			Prot			Prot	Prot			Prot	
Protected Phases	3	8		7	4		5	5	2		1	6
Permitted Phases												
Actuated Green, G (s)	15.0	28.0		24.0	37.0			10.0	70.0		12.0	72.0
Effective Green, g (s)	15.0	28.0		24.0	37.0			10.0	70.0		12.0	72.0
Actuated g/C Ratio	0.10	0.19		0.16	0.25			0.07	0.47		0.08	0.48
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	378	677		604	955			252	1766		302	1809
v/s Ratio Prot	0.19	c0.32		c0.32	0.27			0.11	0.68		c0.14	c0.87
v/s Ratio Perm												
v/c Ratio	1.88	1.69		2.02	1.08			2.35dl	1.45		1.81	1.82
Uniform Delay, d1	67.5	61.0		63.0	56.5			70.0	40.0		69.0	39.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	405.2	318.6		466.2	51.7			334.3	204.5		376.5	369.2
Delay (s)	472.7	379.6		529.2	108.2			404.3	244.5		445.5	408.2
Level of Service	F	F		F	F			F	F		F	F
Approach Delay (s)		413.5			336.9				267.4			413.5
Approach LOS		F			F				F			F

Intersection Summary

HCM Average Control Delay	358.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	177.2%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

102: E Jensen Ave & Golden State Blvd

4/25/2011












Movement	NWR
Lane Configurations	
Volume (vph)	649
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	705
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Unsignalized Intersection Capacity Analysis

103: RailRoad Ave & Orange Ave










4/25/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	136	82	35	131	26	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	148	89	38	142	28	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			237		411	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			237		411	192
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		95	96
cM capacity (veh/h)			1330		580	849
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	237	180	60			
Volume Left	0	38	28			
Volume Right	89	0	32			
cSH	1700	1330	696			
Volume to Capacity	0.14	0.03	0.09			
Queue Length 95th (ft)	0	2	7			
Control Delay (s)	0.0	1.8	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.8	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			34.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

103: Orange Ave &



















4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (veh/h)	64	132	404	90	95	421
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	143	439	98	103	458
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1152	488			537	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1152	488			537	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	65	75			90	
cM capacity (veh/h)	197	580			1031	
Direction, Lane #	EB 1	SE 1	NW 1			
Volume Total	213	537	561			
Volume Left	70	0	103			
Volume Right	143	98	0			
cSH	354	1700	1031			
Volume to Capacity	0.60	0.32	0.10			
Queue Length 95th (ft)	93	0	8			
Control Delay (s)	29.4	0.0	2.6			
Lane LOS	D		A			
Approach Delay (s)	29.4	0.0	2.6			
Approach LOS	D					
Intersection Summary						
Average Delay			5.9			
Intersection Capacity Utilization			75.8%	ICU Level of Service		D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

104: Orange Ave & Golden State Blvd



















4/25/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	43	8	27	24	17	81	64	1081	79	29	828	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	9	29	26	18	88	70	1175	86	32	900	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage (veh)								1			1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1879	2348	630	1708	2377	464	928			1261		
vC1, stage 1 conf vol	1357	1357		977	977							
vC2, stage 2 conf vol	522	991		731	1400							
vCu, unblocked vol	1879	2348	630	1708	2377	464	928			1261		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	53	92	93	81	82	84	91			94		
cM capacity (veh/h)	99	111	424	141	105	545	732			547		
Direction, Lane #	NB 1	SB 1	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3				
Volume Total	85	133	70	783	478	32	600	328				
Volume Left	47	26	70	0	0	32	0	0				
Volume Right	29	88	0	0	86	0	0	28				
cSH	137	254	732	1700	1700	547	1700	1700				
Volume to Capacity	0.62	0.52	0.09	0.46	0.28	0.06	0.35	0.19				
Queue Length 95th (ft)	81	69	8	0	0	5	0	0				
Control Delay (s)	66.4	33.7	10.4	0.0	0.0	12.0	0.0	0.0				
Lane LOS	F	D	B			B						
Approach Delay (s)	66.4	33.7	0.5			0.4						
Approach LOS	F	D										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			56.1%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

104: Orange Ave & Golden State Blvd

4/25/2011



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	123	27	96	15	16	125	156	1562	96	61	1435	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	134	29	104	16	17	136	170	1698	104	66	1560	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage (veh)								1			1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3010	3824	901	2916	3855	801	1602			1802		
vC1, stage 1 conf vol	2089	2089		1714	1714							
vC2, stage 2 conf vol	921	1735		1203	2141							
vCu, unblocked vol	3010	3824	901	2916	3855	801	1602			1802		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	63	0	0	58	58			80		
cM capacity (veh/h)	0	2	281	0	2	327	404			338		
Direction, Lane #	NB 1	SB 1	SE 1	SE 2	SE 3	NW 1	NW 2	NW 3				
Volume Total	267	170	170	1132	670	66	1040	562				
Volume Left	134	16	170	0	0	66	0	0				
Volume Right	104	136	0	0	104	0	0	42				
cSH	0	0	404	1700	1700	338	1700	1700				
Volume to Capacity	Err	Err	0.42	0.67	0.39	0.20	0.61	0.33				
Queue Length 95th (ft)	Err	Err	51	0	0	18	0	0				
Control Delay (s)	Err	Err	20.2	0.0	0.0	18.2	0.0	0.0				
Lane LOS	F	F	C			C						
Approach Delay (s)	Err	Err	1.7			0.7						
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			86.4%		ICU Level of Service				E			
Analysis Period (min)			15									

**HANFORD NO-BUILD CONDITIONS
SYNCHRO OUTPUT**

HCM Unsignalized Intersection Capacity Analysis

1: SR 198 & 9 th Ave



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	689	26	116	879	28	0	0	47	0	0	565
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	749	28	126	955	30	0	0	51	0	0	614
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	986			777			2211	2105	389	1753	2104	493
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	986			777			2211	2105	389	1753	2104	493
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			85			0	100	92	100	100	0
cM capacity (veh/h)	696			835			0	40	610	42	40	522
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	52	499	278	126	637	349	51	614				
Volume Left	52	0	0	126	0	0	0	0				
Volume Right	0	0	28	0	0	30	51	614				
cSH	696	1700	1700	835	1700	1700	610	522				
Volume to Capacity	0.07	0.29	0.16	0.15	0.37	0.21	0.08	1.18				
Queue Length 95th (ft)	6	0	0	13	0	0	7	550				
Control Delay (s)	10.6	0.0	0.0	10.1	0.0	0.0	11.4	124.2				
Lane LOS	B			B			B	F				
Approach Delay (s)	0.7			1.1			11.4	124.2				
Approach LOS							B	F				
Intersection Summary												
Average Delay			30.2									
Intersection Capacity Utilization			66.8%			ICU Level of Service				C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: SR 198 & 9 th Ave
















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	838	960	33	38	944	59	0	0	314	0	0	95
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	911	1043	36	41	1026	64	0	0	341	0	0	103
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1090			1079			3582	4056	540	3826	4042	545
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1090			1079			3582	4056	540	3826	4042	545
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			94			0	0	30	0	0	79
cM capacity (veh/h)	636			642			0	0	486	0	0	482
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	911	696	384	41	684	406	341	103				
Volume Left	911	0	0	41	0	0	0	0				
Volume Right	0	0	36	0	0	64	341	103				
cSH	636	1700	1700	642	1700	1700	486	482				
Volume to Capacity	1.43	0.41	0.23	0.06	0.40	0.24	0.70	0.21				
Queue Length 95th (ft)	1061	0	0	5	0	0	136	20				
Control Delay (s)	222.6	0.0	0.0	11.0	0.0	0.0	28.0	14.5				
Lane LOS	F			B			D	B				
Approach Delay (s)	101.9			0.4			28.0	14.5				
Approach LOS							D	B				
Intersection Summary												
Average Delay			60.1									
Intersection Capacity Utilization			81.1%			ICU Level of Service			D			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: SR 198 WB off ramp & SR 198 WB on ramp
















10/12/2010

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (veh/h)	40	0	83	0	191	0	0	551	74	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	0	90	0	208	0	0	599	80	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	847	887	208	679			208			892	847
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	847	887	208	679			208			892	847
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	85	100	89	100			100			100	100
cM capacity (veh/h)	282	283	833	913			1363			234	299
Direction, Lane #	WB 1	NB 1	SB 1								
Volume Total	134	208	679								
Volume Left	43	0	0								
Volume Right	90	0	80								
cSH	867	1700	1700								
Volume to Capacity	0.15	0.12	0.40								
Queue Length 95th (ft)	14	0	0								
Control Delay (s)	13.2	0.0	0.0								
Lane LOS	B										
Approach Delay (s)	13.2	0.0	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay		1.7									
Intersection Capacity Utilization		50.6%			ICU Level of Service				A		
Analysis Period (min)		15									

HCM Unsignalized Intersection Capacity Analysis

2: SR 198 WB off ramp & SR 198 WB on ramp
















10/12/2010

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (veh/h)	48	0	182	0	710	0	0	251	67	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	0	198	0	772	0	0	273	73	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage veh											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1081	1117	772	346			772			1180	1081
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1081	1117	772	346			772			1180	1081
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	73	100	50	100			100			100	100
cM capacity (veh/h)	195	207	400	1213			843			84	218
Direction, Lane #	WB 1	NB 1	SB 1								
Volume Total	250	772	346								
Volume Left	52	0	0								
Volume Right	198	0	73								
cSH	505	1700	1700								
Volume to Capacity	0.50	0.45	0.20								
Queue Length 95th (ft)	68	0	0								
Control Delay (s)	24.1	0.0	0.0								
Lane LOS	C										
Approach Delay (s)	24.1	0.0	0.0								
Approach LOS	C										
Intersection Summary											
Average Delay		4.4									
Intersection Capacity Utilization		55.3%		ICU Level of Service					B		
Analysis Period (min)		15									

HCM Unsignalized Intersection Capacity Analysis

3: SR 198 EB off ramp & SR 198 EB on ramp
















10/12/2010

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (veh/h)	43	0	228	0	255	35	0	566	0	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	0	248	0	277	38	0	615	0	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	911	930	615	615			315			1035	911
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	911	930	615	615			315			1035	911
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	82	100	50	100			100			100	100
cM capacity (veh/h)	255	267	491	964			1245			104	274
Direction, Lane #	EB 1	NB 1	SB 1								
Volume Total	295	315	615								
Volume Left	47	0	0								
Volume Right	248	38	0								
cSH	584	1700	1700								
Volume to Capacity	0.50	0.19	0.36								
Queue Length 95th (ft)	71	0	0								
Control Delay (s)	20.0	0.0	0.0								
Lane LOS	C										
Approach Delay (s)	20.0	0.0	0.0								
Approach LOS	C										
Intersection Summary											
Average Delay		4.8									
Intersection Capacity Utilization		50.6%		ICU Level of Service					A		
Analysis Period (min)		15									

HCM Unsignalized Intersection Capacity Analysis

3: SR 198 EB off ramp & SR 198 EB on ramp



















10/12/2010

											
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (veh/h)	77	0	213	0	814	109	0	272	0	0	0
Sign Control		Stop			Free			Free		Yield	
Grade		0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	84	0	232	0	885	118	0	296	0	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)			1								
Median type					None			None			
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1240	1299	296	296			1003			1355	1240
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1240	1299	296	296			1003			1355	1240
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	45	100	69	100			100			100	100
cM capacity (veh/h)	152	161	744	1266			690			87	175
Direction, Lane #	EB 1	NB 1	SB 1								
Volume Total	315	1003	296								
Volume Left	84	0	0								
Volume Right	232	118	0								
cSH	469	1700	1700								
Volume to Capacity	0.67	0.59	0.17								
Queue Length 95th (ft)	122	0	0								
Control Delay (s)	27.0	0.0	0.0								
Lane LOS	D										
Approach Delay (s)	27.0	0.0	0.0								
Approach LOS	D										
Intersection Summary											
Average Delay			5.3								
Intersection Capacity Utilization			55.3%			ICU Level of Service			B		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

4: SR 198 & 7th Ave



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	545	6	47	771	11	4	12	17	79	14	96
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	592	7	51	838	12	4	13	18	86	15	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	850			599			1435	1754	299	1474	1752	425
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	850			599			1435	1754	299	1474	1752	425
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			95			92	81	97	0	78	82
cM capacity (veh/h)	784			974			56	69	697	64	70	578
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	103	395	204	51	559	291	36	205				
Volume Left	103	0	0	51	0	0	4	86				
Volume Right	0	0	7	0	0	12	18	104				
cSH	784	1700	1700	974	1700	1700	123	118				
Volume to Capacity	0.13	0.23	0.12	0.05	0.33	0.17	0.29	1.75				
Queue Length 95th (ft)	11	0	0	4	0	0	28	396				
Control Delay (s)	10.3	0.0	0.0	8.9	0.0	0.0	46.1	432.5				
Lane LOS	B			A			E	F				
Approach Delay (s)	1.5			0.5			46.1	432.5				
Approach LOS							E	F				
Intersection Summary												
Average Delay			49.9									
Intersection Capacity Utilization			54.6%			ICU Level of Service			A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SR 198 & 7th Ave



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	51	975	11	18	1033	9	46	155	67	16	7	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	1060	12	20	1123	10	50	168	73	17	8	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1133			1072			1802	2348	536	1965	2349	566
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1133			1072			1802	2348	536	1965	2349	566
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			97			0	0	85	0	76	96
cM capacity (veh/h)	613			646			35	31	489	0	31	467
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	55	707	365	20	749	384	291	46				
Volume Left	55	0	0	20	0	0	50	17				
Volume Right	0	0	12	0	0	10	73	21				
cSH	613	1700	1700	646	1700	1700	42	0				
Volume to Capacity	0.09	0.42	0.21	0.03	0.44	0.23	6.93	Err				
Queue Length 95th (ft)	7	0	0	2	0	0	Err	Err				
Control Delay (s)	11.5	0.0	0.0	10.7	0.0	0.0	Err	Err				
Lane LOS	B			B			F	F				
Approach Delay (s)	0.6			0.2			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			58.2%		ICU Level of Service			B				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: SR 198 & 6th St



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	86	533	13	4	738	4	11	5	6	4	8	84
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	579	14	4	802	4	12	5	7	4	9	91
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	807			593			1279	1589	297	1299	1593	403
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	807			593			1279	1589	297	1299	1593	403
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			100			86	94	99	96	91	85
cM capacity (veh/h)	814			979			88	94	700	102	93	597
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	93	386	207	4	535	272	24	104				
Volume Left	93	0	0	4	0	0	12	4				
Volume Right	0	0	14	0	0	4	7	91				
cSH	814	1700	1700	979	1700	1700	118	362				
Volume to Capacity	0.11	0.23	0.12	0.00	0.31	0.16	0.20	0.29				
Queue Length 95th (ft)	10	0	0	0	0	0	18	29				
Control Delay (s)	10.0	0.0	0.0	8.7	0.0	0.0	43.1	18.9				
Lane LOS	A			A			E	C				
Approach Delay (s)	1.4			0.0			43.1	18.9				
Approach LOS							E	C				
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			41.5%			ICU Level of Service			A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: SR 198 & 6th St



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	99	944	8	3	950	10	0	42	23	2	3	103
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	1026	9	3	1033	11	0	46	25	2	3	112
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1043			1035			1882	2296	517	1821	2295	522
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1043			1035			1882	2296	517	1821	2295	522
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			100			100	0	95	0	90	78
cM capacity (veh/h)	662			667			27	32	503	0	32	500
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	108	684	351	3	688	355	71	117				
Volume Left	108	0	0	3	0	0	0	2				
Volume Right	0	0	9	0	0	11	25	112				
cSH	662	1700	1700	667	1700	1700	48	0				
Volume to Capacity	0.16	0.40	0.21	0.00	0.40	0.21	1.48	Err				
Queue Length 95th (ft)	14	0	0	0	0	0	169	Err				
Control Delay (s)	11.5	0.0	0.0	10.4	0.0	0.0	434.9	Err				
Lane LOS	B			B			F	F				
Approach Delay (s)	1.1			0.0			434.9	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	50.4%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

7: SR 198 & 2nd Ave.



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	518	14	114	731	4	3	6	44	2	7	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	563	15	124	795	4	3	7	48	2	8	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	799			578			1247	1626	289	1386	1632	399
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	799			578			1247	1626	289	1386	1632	399
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			88			97	93	93	97	91	97
cM capacity (veh/h)	819			991			106	88	707	81	87	600
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	4	375	203	124	530	269	58	28				
Volume Left	4	0	0	124	0	0	3	2				
Volume Right	0	0	15	0	0	4	48	18				
cSH	819	1700	1700	991	1700	1700	334	196				
Volume to Capacity	0.01	0.22	0.12	0.12	0.31	0.16	0.17	0.14				
Queue Length 95th (ft)	0	0	0	11	0	0	15	12				
Control Delay (s)	9.4	0.0	0.0	9.1	0.0	0.0	18.0	26.5				
Lane LOS	A			A			C	D				
Approach Delay (s)	0.1			1.2			18.0	26.5				
Approach LOS							C	D				
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			37.6%			ICU Level of Service		A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SR 198 & 2nd Ave.



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	945	17	45	891	8	10	8	132	3	13	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1027	18	49	968	9	11	9	143	3	14	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	977			1046			1686	2155	523	1776	2160	489
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	977			1046			1686	2155	523	1776	2160	489
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			73	79	71	89	66	97
cM capacity (veh/h)	702			661			40	42	499	29	42	525
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	22	685	361	49	646	332	163	35				
Volume Left	22	0	0	49	0	0	11	3				
Volume Right	0	0	18	0	0	9	143	17				
cSH	702	1700	1700	661	1700	1700	214	72				
Volume to Capacity	0.03	0.40	0.21	0.07	0.38	0.20	0.76	0.48				
Queue Length 95th (ft)	2	0	0	6	0	0	131	49				
Control Delay (s)	10.3	0.0	0.0	10.9	0.0	0.0	61.1	94.4				
Lane LOS	B			B			F	F				
Approach Delay (s)	0.2			0.5			61.1	94.4				
Approach LOS							F	F				
Intersection Summary												
Average Delay			6.1									
Intersection Capacity Utilization			51.1%				ICU Level of Service			A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Lacey Blvd. & 8th Ave



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	7	66	44	11	20	65	231	43	55	513	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	8	72	48	12	22	71	251	47	60	558	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1105	1124	565	1097	1108	274	573			298		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1105	1124	565	1097	1108	274	573			298		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	96	86	67	94	97	93			95		
cM capacity (veh/h)	159	182	524	145	186	764	1000			1263		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	95	82	71	298	60	573						
Volume Left	15	48	71	0	60	0						
Volume Right	72	22	0	47	0	15						
cSH	344	193	1000	1700	1263	1700						
Volume to Capacity	0.27	0.42	0.07	0.18	0.05	0.34						
Queue Length 95th (ft)	27	48	6	0	4	0						
Control Delay (s)	19.4	36.6	8.9	0.0	8.0	0.0						
Lane LOS	C	E	A		A							
Approach Delay (s)	19.4	36.6	1.7		0.8							
Approach LOS	C	E										
Intersection Summary												
Average Delay			5.0									
Intersection Capacity Utilization			52.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Lacey Blvd & 8th Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	11	71	27	10	39	96	782	69	15	240	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	12	77	29	11	42	104	850	75	16	261	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1421	1448	282	1396	1431	888	302			925		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1421	1448	282	1396	1431	888	302			925		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	67	90	90	68	91	88	92			98		
cM capacity (veh/h)	86	118	757	91	121	343	1259			739		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	117	83	104	925	16	302						
Volume Left	28	29	104	0	16	0						
Volume Right	77	42	0	75	0	41						
cSH	220	154	1259	1700	739	1700						
Volume to Capacity	0.53	0.54	0.08	0.54	0.02	0.18						
Queue Length 95th (ft)	70	67	7	0	2	0						
Control Delay (s)	38.6	52.8	8.1	0.0	10.0	0.0						
Lane LOS	E	F	A		A							
Approach Delay (s)	38.6	52.8	0.8		0.5							
Approach LOS	E	F										
Intersection Summary												
Average Delay			6.4									
Intersection Capacity Utilization			66.1%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

9: Grangeville Blvd & 8th Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	153	90	77	69	27	39	178	43	102	469	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.96		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1759		1770	1785		1770	1808		1770	1859	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1759		1770	1785		1770	1808		1770	1859	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	166	98	84	75	29	42	193	47	111	510	7
RTOR Reduction (vph)	0	22	0	0	13	0	0	10	0	0	1	0
Lane Group Flow (vph)	10	242	0	84	91	0	42	230	0	111	516	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.1	16.3		6.9	22.1		4.1	21.0		7.7	24.6	
Effective Green, g (s)	1.1	16.3		6.9	22.1		4.1	21.0		7.7	24.6	
Actuated g/C Ratio	0.02	0.24		0.10	0.33		0.06	0.31		0.11	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	29	422		180	581		107	559		201	674	
v/s Ratio Prot	0.01	c0.14		c0.05	0.05		0.02	0.13		c0.06	c0.28	
v/s Ratio Perm												
v/c Ratio	0.34	0.57		0.47	0.16		0.39	0.41		0.55	0.77	
Uniform Delay, d1	33.0	22.7		28.8	16.3		30.7	18.6		28.5	19.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.0	1.9		1.9	0.1		2.4	0.5		3.3	5.2	
Delay (s)	40.1	24.6		30.7	16.4		33.1	19.1		31.7	24.3	
Level of Service	D	C		C	B		C	B		C	C	
Approach Delay (s)		25.2			22.8			21.1			25.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			67.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			59.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Grangeville Blvd. & 8th Ave

10/12/2010











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	73	37	67	164	103	113	706	52	36	212	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flt	1.00	0.95		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1769		1770	1755		1770	1843		1770	1846	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1769		1770	1755		1770	1843		1770	1846	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	79	40	73	178	112	123	767	57	39	230	15
RTOR Reduction (vph)	0	16	0	0	18	0	0	2	0	0	2	0
Lane Group Flow (vph)	13	103	0	73	272	0	123	822	0	39	243	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.3	15.1		7.6	21.4		11.2	46.9		4.7	40.4	
Effective Green, g (s)	1.3	15.1		7.6	21.4		11.2	46.9		4.7	40.4	
Actuated g/C Ratio	0.01	0.17		0.08	0.24		0.12	0.52		0.05	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	25	296		149	416		220	957		92	826	
v/s Ratio Prot	0.01	0.06		c0.04	c0.15		c0.07	c0.45		0.02	0.13	
v/s Ratio Perm												
v/c Ratio	0.52	0.35		0.49	0.65		0.56	0.86		0.42	0.29	
Uniform Delay, d1	44.2	33.3		39.5	31.1		37.2	18.8		41.5	15.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.1	0.7		2.5	3.7		3.1	7.8		3.1	0.2	
Delay (s)	62.3	34.0		42.0	34.8		40.3	26.6		44.6	16.1	
Level of Service	E	C		D	C		D	C		D	B	
Approach Delay (s)		36.8			36.2			28.4			20.0	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM Average Control Delay		29.3					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		90.3					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		68.6%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

**BAKERSFIELD NO-BUILD CONDITIONS
SYNCHRO OUTPUT**

HCM Signalized Intersection Capacity Analysis

1: SR-58 EB Off Ramp & S Union Ave











10/12/2010

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1168	419	0	2213	1336	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.9	4.9	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	4926	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	4926	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1270	455	0	2405	1452	382
RTOR Reduction (vph)	0	2	0	0	32	0
Lane Group Flow (vph)	1270	453	0	2405	1802	0
Turn Type	Perm					
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	85.8	85.8		55.1	55.1	
Effective Green, g (s)	85.8	85.8		55.1	55.1	
Actuated g/C Ratio	0.57	0.57		0.37	0.37	
Clearance Time (s)	4.2	4.2		4.9	4.9	
Vehicle Extension (s)	3.0	3.0		4.0	4.0	
Lane Grp Cap (vph)	1012	905		1868	1809	
v/s Ratio Prot	c0.72			c0.47	0.37	
v/s Ratio Perm		0.29				
v/c Ratio	1.25	0.50		1.29	1.00	
Uniform Delay, d1	32.1	19.3		47.4	47.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	122.9	0.4		133.5	20.2	
Delay (s)	155.0	19.7		181.0	67.5	
Level of Service	F	B		F	E	
Approach Delay (s)	119.3			181.0	67.5	
Approach LOS	F			F	E	
Intersection Summary						
HCM Average Control Delay		128.3		HCM Level of Service		F
HCM Volume to Capacity ratio		1.27				
Actuated Cycle Length (s)		150.0		Sum of lost time (s)		9.1
Intersection Capacity Utilization		115.1%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

1: SR-58 EB Off Ramp & S Union Ave



















10/12/2010

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	586	651	0	1432	1123	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.9	4.9	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Flt	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	4881	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	4881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	637	708	0	1557	1221	448
RTOR Reduction (vph)	0	9	0	0	102	0
Lane Group Flow (vph)	637	699	0	1557	1567	0
Turn Type	Perm					
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.7	29.7		26.1	26.1	
Effective Green, g (s)	29.7	29.7		26.1	26.1	
Actuated g/C Ratio	0.46	0.46		0.40	0.40	
Clearance Time (s)	4.2	4.2		4.9	4.9	
Vehicle Extension (s)	3.0	3.0		4.0	4.0	
Lane Grp Cap (vph)	810	724		2045	1963	
v/s Ratio Prot	0.36			0.31	c0.32	
v/s Ratio Perm		c0.44				
v/c Ratio	0.79	0.97		0.76	0.80	
Uniform Delay, d1	14.9	17.1		16.7	17.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	24.9		1.8	2.5	
Delay (s)	20.0	42.0		18.6	19.6	
Level of Service	B	D		B	B	
Approach Delay (s)	31.6			18.6	19.6	
Approach LOS	C			B	B	
Intersection Summary						
HCM Average Control Delay			22.8		HCM Level of Service	C
HCM Volume to Capacity ratio			0.89			
Actuated Cycle Length (s)			64.9		Sum of lost time (s)	9.1
Intersection Capacity Utilization			78.8%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

2: SR-58 Off Ramp & MT Vernon Ave



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	546	2	432	0	0	0	0	268	50	131	360	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Lane Util. Factor	0.95	0.95						0.95	1.00	1.00	0.95	
Frt	1.00	0.87						1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.99						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1526						3539	1583	1770	3539	
Flt Permitted	0.95	0.99						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1526						3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	593	2	470	0	0	0	0	291	54	142	391	0
RTOR Reduction (vph)	0	237	0	0	0	0	0	0	42	0	0	0
Lane Group Flow (vph)	534	294	0	0	0	0	0	291	12	142	391	0
Turn Type	Split								Perm		Prot	
Protected Phases	8	8						6		5	2	
Permitted Phases									6			
Actuated Green, G (s)	21.7	21.7						12.1	12.1	6.0	21.8	
Effective Green, g (s)	21.7	21.7						12.1	12.1	6.0	21.8	
Actuated g/C Ratio	0.41	0.41						0.23	0.23	0.11	0.41	
Clearance Time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Vehicle Extension (s)	3.8	3.8						4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	683	620						802	359	199	1445	
v/s Ratio Prot	c0.32	0.19						c0.08		c0.08	0.11	
v/s Ratio Perm									0.01			
v/c Ratio	0.78	0.47						0.36	0.03	0.71	0.27	
Uniform Delay, d1	13.8	11.7						17.4	16.1	22.9	10.5	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.1	0.7						0.5	0.1	9.6	0.2	
Delay (s)	19.9	12.4						17.9	16.2	32.5	10.7	
Level of Service	B	B						B	B	C	B	
Approach Delay (s)		16.1			0.0			17.6			16.5	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay		16.5			HCM Level of Service				B			
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		53.4			Sum of lost time (s)				13.6			
Intersection Capacity Utilization		55.6%			ICU Level of Service				B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: SR-58 Off Ramp & MT Vernon Ave
























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1056	7	174	0	0	0	0	280	68	236	114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Lane Util. Factor	0.95	0.95						0.95	1.00	1.00	0.95	
Frt	1.00	0.96						1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1636						3539	1583	1770	3539	
Flt Permitted	0.95	0.97						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1636						3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1148	8	189	0	0	0	0	304	74	257	124	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	61	0	0	0
Lane Group Flow (vph)	689	641	0	0	0	0	0	304	13	257	124	0
Turn Type	Split								Perm	Prot		
Protected Phases	8	8						6		5	2	
Permitted Phases									6			
Actuated Green, G (s)	38.5	38.5						14.3	14.3	13.9	31.9	
Effective Green, g (s)	38.5	38.5						14.3	14.3	13.9	31.9	
Actuated g/C Ratio	0.48	0.48						0.18	0.18	0.17	0.40	
Clearance Time (s)	4.6	4.6						5.3	5.3	3.7	5.3	
Vehicle Extension (s)	3.8	3.8						4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	806	784						630	282	306	1406	
v/s Ratio Prot	c0.41	0.39						c0.09		c0.15	0.04	
v/s Ratio Perm									0.01			
v/c Ratio	0.85	0.82						0.48	0.05	0.84	0.09	
Uniform Delay, d1	18.4	17.9						29.7	27.4	32.1	15.1	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.1	6.9						1.0	0.1	17.3	0.0	
Delay (s)	27.5	24.8						30.7	27.5	49.4	15.2	
Level of Service	C	C						C	C	D	B	
Approach Delay (s)		26.2			0.0			30.1			38.3	
Approach LOS		C			A			C			D	
Intersection Summary												
HCM Average Control Delay			29.1									HCM Level of Service C
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			80.3							13.6		Sum of lost time (s)
Intersection Capacity Utilization			67.7%							C		ICU Level of Service
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: E Brundage Lane & Oak St
























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	236	171	104	185	65	374	409	171	36	212	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3401		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3401		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	257	186	113	201	71	407	445	186	39	230	284
RTOR Reduction (vph)	0	0	149	0	49	0	0	0	125	0	0	244
Lane Group Flow (vph)	226	257	38	113	223	0	407	445	61	39	230	40
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			8
Actuated Green, G (s)	11.0	12.5	12.5	8.3	9.8		14.5	20.3	20.3	2.9	8.7	8.7
Effective Green, g (s)	11.0	12.5	12.5	8.3	9.8		14.5	20.3	20.3	2.9	8.7	8.7
Actuated g/C Ratio	0.18	0.20	0.20	0.13	0.16		0.23	0.33	0.33	0.05	0.14	0.14
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	314	714	319	237	538		414	1159	518	83	497	222
v/s Ratio Prot	c0.13	0.07		0.06	c0.07		c0.23	c0.13		0.02	0.06	
v/s Ratio Perm			0.02						0.04			0.03
v/c Ratio	0.72	0.36	0.12	0.48	0.41		0.98	0.38	0.12	0.47	0.46	0.18
Uniform Delay, d1	24.0	21.3	20.2	24.8	23.5		23.6	16.0	14.6	28.8	24.5	23.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	0.1	0.1	0.6	0.2		39.4	0.1	0.0	1.5	0.2	0.1
Delay (s)	30.5	21.4	20.3	25.4	23.7		63.1	16.1	14.6	30.3	24.8	23.6
Level of Service	C	C	C	C	C		E	B	B	C	C	C
Approach Delay (s)		24.2			24.2			34.3			24.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			28.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			62.0			Sum of lost time (s)				13.0		
Intersection Capacity Utilization			60.3%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: E Brundage Lane & Oak St

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	365	473	673	214	281	102	460	442	180	89	770	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3398		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3398		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	397	514	732	233	305	111	500	480	196	97	837	560
RTOR Reduction (vph)	0	0	349	0	26	0	0	0	161	0	0	321
Lane Group Flow (vph)	397	514	383	233	390	0	500	480	35	97	837	239
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			8
Actuated Green, G (s)	31.0	35.0	35.0	19.8	23.8		39.0	25.5	25.5	46.5	33.0	33.0
Effective Green, g (s)	31.0	35.0	35.0	19.8	23.8		39.0	25.5	25.5	46.5	33.0	33.0
Actuated g/C Ratio	0.21	0.24	0.24	0.14	0.16		0.27	0.18	0.18	0.32	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	379	855	383	242	559		477	623	279	568	807	361
v/s Ratio Prot	0.22	0.15		c0.13	c0.11		c0.28	0.14		0.05	c0.24	
v/s Ratio Perm			c0.24						0.02			0.15
v/c Ratio	1.05	0.60	1.00	0.96	0.70		1.05	0.77	0.12	0.17	1.04	0.66
Uniform Delay, d1	56.9	48.7	54.9	62.1	57.1		52.9	56.9	50.2	35.3	55.9	50.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	59.2	0.8	46.1	47.0	3.1		54.4	5.3	0.1	0.1	41.7	3.5
Delay (s)	116.1	49.5	101.0	109.1	60.2		107.3	62.2	50.3	35.4	97.6	54.3
Level of Service	F	D	F	F	E		F	E	D	D	F	D
Approach Delay (s)		88.5			77.7			79.4			77.3	
Approach LOS		F			E			E			E	























Intersection Summary

HCM Average Control Delay	81.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	144.8	Sum of lost time (s)	23.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: E Brundage Lane & Chester Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	311	91	123	247	26	84	674	309	44	484	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3489		1770	3372		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3489		1770	3372		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	338	99	134	268	28	91	733	336	48	526	79
RTOR Reduction (vph)	0	0	77	0	11	0	0	61	0	0	0	52
Lane Group Flow (vph)	164	338	22	134	285	0	91	1008	0	48	526	27
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	8.9	13.5	13.5	6.0	10.6		5.7	23.0		3.4	20.7	20.7
Effective Green, g (s)	8.9	13.5	13.5	6.0	10.6		5.7	23.0		3.4	20.7	20.7
Actuated g/C Ratio	0.14	0.22	0.22	0.10	0.17		0.09	0.37		0.06	0.34	0.34
Clearance Time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	255	774	346	172	599		164	1257		98	1187	531
v/s Ratio Prot	0.09	c0.10		c0.08	0.08		c0.05	c0.30		0.03	0.15	
v/s Ratio Perm			0.01									0.02
v/c Ratio	0.64	0.44	0.06	0.78	0.48		0.55	0.80		0.49	0.44	0.05
Uniform Delay, d1	24.9	20.8	19.1	27.2	23.0		26.8	17.3		28.3	16.0	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.1	0.0	18.1	0.2		2.3	3.6		1.4	0.1	0.0
Delay (s)	29.0	21.0	19.1	45.3	23.3		29.1	20.9		29.7	16.1	13.9
Level of Service	C	C	B	D	C		C	C		C	B	B
Approach Delay (s)		22.9			30.1			21.5			16.8	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay			22.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			61.7			Sum of lost time (s)			11.4			
Intersection Capacity Utilization			63.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: E Brundage Lane & Chester Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	317	152	263	380	52	79	608	255	68	911	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3475		1770	3382		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3475		1770	3382		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	345	165	286	413	57	86	661	277	74	990	186
RTOR Reduction (vph)	0	0	137	0	12	0	0	48	0	0	0	122
Lane Group Flow (vph)	147	345	28	286	458	0	86	890	0	74	990	64
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	9.9	12.7	12.7	15.0	17.8		5.5	25.9		5.4	25.8	25.8
Effective Green, g (s)	9.9	12.7	12.7	15.0	17.8		5.5	25.9		5.4	25.8	25.8
Actuated g/C Ratio	0.13	0.17	0.17	0.20	0.24		0.07	0.35		0.07	0.34	0.34
Clearance Time (s)	3.5	4.4	4.4	3.5	4.4		3.5	4.4		3.5	4.4	4.4
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	234	601	269	355	827		130	1171		128	1221	546
v/s Ratio Prot	0.08	0.10		c0.16	c0.13		c0.05	0.26		0.04	c0.28	
v/s Ratio Perm			0.02									0.04
v/c Ratio	0.63	0.57	0.10	0.81	0.55		0.66	0.76		0.58	0.81	0.12
Uniform Delay, d1	30.7	28.6	26.2	28.5	25.0		33.7	21.7		33.6	22.3	16.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	0.8	0.1	11.8	0.5		9.4	2.6		3.9	4.0	0.0
Delay (s)	34.5	29.4	26.3	40.4	25.5		43.1	24.3		37.5	26.3	16.8
Level of Service	C	C	C	D	C		D	C		D	C	B
Approach Delay (s)		29.8			31.1			25.8			25.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			27.5			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			74.8			Sum of lost time (s)			11.4			
Intersection Capacity Utilization			67.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: E Brundage Lane & P Street























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	284	220	30	44	234	39	39	177	56	33	71	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3475		1770	3464		1770	1863	1583	1770	1684	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	1770	3475		1770	3464		1157	1863	1583	1186	1684	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	309	239	33	48	254	42	42	192	61	36	77	136
RTOR Reduction (vph)	0	12	0	0	20	0	0	0	50	0	103	0
Lane Group Flow (vph)	309	260	0	48	276	0	42	192	11	36	110	0
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5		2	1		6			8			4
Permitted Phases							8			8		4
Actuated Green, G (s)	13.1	21.4		2.2	10.5		8.2	8.2	8.2	8.2	8.2	
Effective Green, g (s)	13.1	21.4		2.2	10.5		8.2	8.2	8.2	8.2	8.2	
Actuated g/C Ratio	0.29	0.47		0.05	0.23		0.18	0.18	0.18	0.18	0.18	
Clearance Time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	506	1624		85	794		207	334	283	212	302	
v/s Ratio Prot	c0.17	0.07		0.03	c0.08			c0.10			0.07	
v/s Ratio Perm							0.04		0.01	0.03		
v/c Ratio	0.61	0.16		0.56	0.35		0.20	0.57	0.04	0.17	0.37	
Uniform Delay, d1	14.1	7.0		21.3	14.8		16.0	17.2	15.5	15.9	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.0		5.0	0.1		0.2	1.5	0.0	0.1	0.3	
Delay (s)	15.7	7.0		26.4	14.9		16.2	18.7	15.6	16.1	16.8	
Level of Service	B	A		C	B		B	B	B	B	B	
Approach Delay (s)		11.6			16.5			17.7			16.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			14.8			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			45.8			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: E Brundage Lane & P Street

























10/12/2010

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (vph)	175	405	66	77	408	43	54	225	71	51	281	299		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	4.0	5.0		4.0	5.0		5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00			
Flt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.92			
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)	1770	3465		1770	3488		1770	1863	1583	1770	1719			
Flt Permitted	0.95	1.00		0.95	1.00		0.16	1.00	1.00	0.58	1.00			
Satd. Flow (perm)	1770	3465		1770	3488		303	1863	1583	1085	1719			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	190	440	72	84	443	47	59	245	77	55	305	325		
RTOR Reduction (vph)	0	18	0	0	12	0	0	0	46	0	46	0		
Lane Group Flow (vph)	190	494	0	84	478	0	59	245	31	55	584	0		
Turn Type	Prot			Prot			Perm		Perm	Perm	Perm			
Protected Phases	5		2	1		6			8		4			
Permitted Phases							8		8		4			
Actuated Green, G (s)	9.7		18.9	5.3		14.5	25.2		25.2	25.2	25.2	25.2		
Effective Green, g (s)	9.7		18.9	5.3		14.5	25.2		25.2	25.2	25.2	25.2		
Actuated g/C Ratio	0.15		0.30	0.08		0.23	0.40		0.40	0.40	0.40	0.40		
Clearance Time (s)	4.0		5.0	4.0		5.0	5.0		5.0	5.0	5.0	5.0		
Vehicle Extension (s)	1.0		2.0	1.0		2.0	1.0		1.0	1.0	1.0	1.0		
Lane Grp Cap (vph)	271		1033	148		798	120		740	629	431	683		
v/s Ratio Prot	c0.11		0.14	0.05		c0.14			0.13		c0.34			
v/s Ratio Perm							0.19			0.02	0.05			
v/c Ratio	0.70		0.48	0.57		0.60	0.49		0.33	0.05	0.13	0.85		
Uniform Delay, d1	25.5		18.2	27.9		21.9	14.3		13.3	11.7	12.1	17.4		
Progression Factor	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Incremental Delay, d2	6.5		0.1	3.0		0.8	1.2		0.1	0.0	0.0	9.8		
Delay (s)	32.0		18.3	30.9		22.7	15.5		13.3	11.7	12.2	27.2		
Level of Service	C		B	C		C	B		B	B	B	C		
Approach Delay (s)			22.0			23.9			13.4		26.0			
Approach LOS			C			C			B					
Intersection Summary														
HCM Average Control Delay			22.2				HCM Level of Service			C				
HCM Volume to Capacity ratio			0.75											
Actuated Cycle Length (s)			63.4				Sum of lost time (s)		14.0					
Intersection Capacity Utilization			76.3%				ICU Level of Service		D					
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

6: E Brundage Lane & S Union ave

























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	112	109	65	298	223	358	98	1428	193	94	1424	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4994		1770	5055	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4994		1770	5055	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	118	71	324	242	389	107	1552	210	102	1548	64
RTOR Reduction (vph)	0	0	60	0	0	152	0	16	0	0	4	0
Lane Group Flow (vph)	122	118	11	324	242	237	107	1746	0	102	1608	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.4	14.9	14.9	19.4	24.9	24.9	8.0	37.4		7.9	37.3	
Effective Green, g (s)	9.4	14.9	14.9	19.4	24.9	24.9	8.0	37.4		7.9	37.3	
Actuated g/C Ratio	0.10	0.15	0.15	0.20	0.26	0.26	0.08	0.39		0.08	0.39	
Clearance Time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Vehicle Extension (s)	2.0	5.4	5.4	2.0	5.3	5.3	2.0	4.5		2.0	5.2	
Lane Grp Cap (vph)	172	545	244	355	910	407	146	1930		144	1948	
v/s Ratio Prot	0.07	0.03		c0.18	0.07		c0.06	c0.35		0.06	0.32	
v/s Ratio Perm			0.01			c0.15						
v/c Ratio	0.71	0.22	0.04	0.91	0.27	0.58	0.73	0.90		0.71	0.83	
Uniform Delay, d1	42.4	35.8	34.9	37.9	28.7	31.4	43.4	28.0		43.3	26.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.4	0.5	0.2	26.5	0.4	3.5	15.0	6.7		12.2	3.4	
Delay (s)	52.8	36.3	35.1	64.4	29.0	34.9	58.4	34.8		55.5	30.2	
Level of Service	D	D	D	E	C	C	E	C		E	C	
Approach Delay (s)		42.5			43.4			36.1			31.7	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay			36.4				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			96.8				Sum of lost time (s)			7.4		
Intersection Capacity Utilization			75.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: E Brundage Lane & S Union ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	195	197	283	282	332	111	1417	267	102	2101	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4964		1770	5060	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4964		1770	5060	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	212	214	308	307	361	121	1540	290	111	2284	79
RTOR Reduction (vph)	0	0	116	0	0	121	0	20	0	0	3	0
Lane Group Flow (vph)	226	212	98	308	307	240	121	1810	0	111	2360	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	18.5	20.5	20.5	23.3	25.3	25.3	9.3	60.9		10.6	62.2	
Effective Green, g (s)	18.5	20.5	20.5	23.3	25.3	25.3	9.3	60.9		10.6	62.2	
Actuated g/C Ratio	0.14	0.15	0.15	0.18	0.19	0.19	0.07	0.46		0.08	0.47	
Clearance Time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9		3.7	4.9	
Vehicle Extension (s)	2.0	5.4	5.4	2.0	5.3	5.3	2.0	4.5		2.0	5.2	
Lane Grp Cap (vph)	247	548	245	311	676	302	124	2282		142	2375	
v/s Ratio Prot	0.13	0.06		c0.17	0.09		c0.07	0.36		0.06	c0.47	
v/s Ratio Perm			0.06			c0.15						
v/c Ratio	0.91	0.39	0.40	0.99	0.45	0.79	0.98	0.79		0.78	0.99	
Uniform Delay, d1	56.2	50.3	50.5	54.5	47.5	51.1	61.5	30.4		59.8	35.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	34.5	1.1	2.6	48.2	1.1	15.4	72.4	2.2		22.2	17.0	
Delay (s)	90.8	51.4	53.0	102.7	48.6	66.5	133.9	32.6		82.0	51.9	
Level of Service	F	D	D	F	D	E	F	C		F	D	
Approach Delay (s)		65.6			72.3			38.9			53.3	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM Average Control Delay		53.1										
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		132.5										
Intersection Capacity Utilization		85.5%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: E Brundage Lane & Liggett Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	341	39	381	276	4	618	58	56	2	88	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.93			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3532		1770	1725			1794	
Flt Permitted	0.55	1.00	1.00	0.50	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	1027	3539	1583	930	3532		1770	1725			1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	371	42	414	300	4	672	63	61	2	96	36
RTOR Reduction (vph)	0	0	24	0	1	0	0	22	0	0	10	0
Lane Group Flow (vph)	21	371	18	414	303	0	672	102	0	0	124	0
Turn Type	Perm		Perm	Perm		Split				Split		
Protected Phases	2			6		8		8		7		
Permitted Phases	2		2		6							
Actuated Green, G (s)	54.9	54.9	54.9	54.9	54.9		47.8	47.8			13.3	
Effective Green, g (s)	54.9	54.9	54.9	54.9	54.9		47.8	47.8			13.3	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42		0.37	0.37			0.10	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			2.0	
Lane Grp Cap (vph)	433	1491	667	392	1488		649	633			183	
v/s Ratio Prot		0.10			0.09		c0.38	0.06			c0.07	
v/s Ratio Perm	0.02		0.01	c0.45								
v/c Ratio	0.05	0.25	0.03	1.06	0.20		1.04	0.16			0.68	
Uniform Delay, d1	22.3	24.4	22.1	37.7	23.9		41.3	27.8			56.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	0.1	0.0	61.0	0.1		44.8	0.2			7.6	
Delay (s)	22.3	24.5	22.1	98.7	24.0		86.0	27.9			64.0	
Level of Service	C	C	C	F	C		F	C			E	
Approach Delay (s)		24.2			67.1			77.0			64.0	
Approach LOS		C			E			E			E	
Intersection Summary												
HCM Average Control Delay	61.7			HCM Level of Service			E					
HCM Volume to Capacity ratio	1.00											
Actuated Cycle Length (s)	130.3			Sum of lost time (s)			14.3					
Intersection Capacity Utilization	88.9%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: E Brundage Lane & Liggett Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	461	53	312	402	4	462	84	104	3	107	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.92			0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3534		1770	1708			1774	
Flt Permitted	0.46	1.00	1.00	0.42	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	858	3539	1583	786	3534		1770	1708			1774	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	501	58	339	437	4	502	91	113	3	116	63
RTOR Reduction (vph)	0	0	28	0	1	0	0	28	0	0	14	0
Lane Group Flow (vph)	64	501	30	339	440	0	502	176	0	0	168	0
Turn Type	Perm		Perm		Perm		Split		Split		Split	
Protected Phases	2				6		8		8		7	
Permitted Phases	2		2		6							
Actuated Green, G (s)	63.4	63.4	63.4	63.4	63.4		39.5	39.5			16.9	
Effective Green, g (s)	63.4	63.4	63.4	63.4	63.4		39.5	39.5			16.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.29	0.29			0.13	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			2.0	
Lane Grp Cap (vph)	406	1673	748	372	1671		521	503			224	
v/s Ratio Prot		0.14			0.12		c0.28	0.10			c0.09	
v/s Ratio Perm	0.07		0.02	c0.43								
v/c Ratio	0.16	0.30	0.04	0.91	0.26		0.96	0.35			0.75	
Uniform Delay, d1	20.1	21.7	19.0	32.7	21.3		46.6	37.2			56.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.1	0.0	26.2	0.1		30.3	0.6			11.8	
Delay (s)	20.4	21.8	19.0	59.0	21.4		76.9	37.8			68.3	
Level of Service	C	C	B	E	C		E	D			E	
Approach Delay (s)		21.4			37.7			65.6			68.3	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM Average Control Delay	44.3				HCM Level of Service				D			
HCM Volume to Capacity ratio	0.91											
Actuated Cycle Length (s)	134.1				Sum of lost time (s)				14.3			
Intersection Capacity Utilization	81.8%				ICU Level of Service				D			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: E Brundage Lane & MT Vernon Ave






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	95	69	194	137	45	59	723	146	46	693	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.96		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1745		1770	1794		1770	3450		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1745		1770	1794		1770	3450		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	103	75	211	149	49	64	786	159	50	753	96
RTOR Reduction (vph)	0	35	0	0	15	0	0	19	0	0	0	64
Lane Group Flow (vph)	78	143	0	211	183	0	64	926	0	50	753	32
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	5.1	10.9		11.1	16.9		3.6	22.2		3.4	22.0	22.0
Effective Green, g (s)	5.1	10.9		11.1	16.9		3.6	22.2		3.4	22.0	22.0
Actuated g/C Ratio	0.08	0.16		0.17	0.26		0.05	0.34		0.05	0.33	0.33
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	1.0	2.0		1.5	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	136	287		297	458		96	1157		91	1176	526
v/s Ratio Prot	0.04	c0.08		c0.12	0.10		c0.04	c0.27		0.03	0.21	
v/s Ratio Perm												0.02
v/c Ratio	0.57	0.50		0.71	0.40		0.67	0.80		0.55	0.64	0.06
Uniform Delay, d1	29.5	25.2		26.0	20.4		30.7	20.0		30.7	18.7	15.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	0.5		6.5	0.2		12.7	3.8		3.6	0.9	0.0
Delay (s)	33.1	25.7		32.5	20.7		43.4	23.8		34.3	19.6	15.1
Level of Service	C	C		C	C		D	C		C	B	B
Approach Delay (s)		27.9			26.8			25.1			20.0	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay			23.8			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			66.2			Sum of lost time (s)			13.3			
Intersection Capacity Utilization			63.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: E Brundage Lane & MT Vernon Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	207	69	152	175	39	77	950	430	58	842	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1793		1770	1812		1770	3374		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1793		1770	1812		1770	3374		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	225	75	165	190	42	84	1033	467	63	915	189
RTOR Reduction (vph)	0	12	0	0	8	0	0	47	0	0	0	94
Lane Group Flow (vph)	150	288	0	165	224	0	84	1453	0	63	915	95
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.1	19.0		10.1	20.0		6.2	44.8		5.4	44.0	44.0
Effective Green, g (s)	9.1	19.0		10.1	20.0		6.2	44.8		5.4	44.0	44.0
Actuated g/C Ratio	0.09	0.19		0.10	0.20		0.06	0.46		0.06	0.45	0.45
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	1.0	2.0		1.5	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	165	348		183	370		112	1544		98	1591	711
v/s Ratio Prot	0.08	c0.16		c0.09	0.12		c0.05	c0.43		0.04	0.26	
v/s Ratio Perm												0.06
v/c Ratio	0.91	0.83		0.90	0.61		0.75	0.94		0.64	0.58	0.13
Uniform Delay, d1	44.0	37.9		43.4	35.4		45.1	25.3		45.3	20.0	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.4	14.2		39.2	1.9		21.8	11.6		10.3	0.3	0.0
Delay (s)	87.4	52.0		82.6	37.3		66.9	36.9		55.6	20.3	15.8
Level of Service	F	D		F	D		E	D		E	C	B
Approach Delay (s)		63.8			56.1			38.5			21.5	
Approach LOS		E			E			D			C	
Intersection Summary												
HCM Average Control Delay			38.1			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			97.9			Sum of lost time (s)			13.3			
Intersection Capacity Utilization			82.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: 4TH Street & Chester Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	110	43	99	84	35	87	609	66	27	335	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1784		1770	1780		1770	3487		1770	3505	
Flt Permitted	0.67	1.00		0.65	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1256	1784		1214	1780		1770	3487		1770	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	120	47	108	91	38	95	662	72	29	364	25
RTOR Reduction (vph)	0	27	0	0	29	0	0	10	0	0	7	0
Lane Group Flow (vph)	60	140	0	108	100	0	95	724	0	29	382	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases	4			8			5			1		
Permitted Phases	4			8						6		
Actuated Green, G (s)	6.6	6.6		6.6	6.6		3.4	17.2		0.8	14.6	
Effective Green, g (s)	6.6	6.6		6.6	6.6		3.4	17.2		0.8	14.6	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.09	0.45		0.02	0.38	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	217	308		210	308		158	1570		37	1340	
v/s Ratio Prot		0.08			0.06		c0.05	c0.21		0.02	0.11	
v/s Ratio Perm	0.05			c0.09								
v/c Ratio	0.28	0.45		0.51	0.32		0.60	0.46		0.78	0.29	
Uniform Delay, d1	13.7	14.2		14.3	13.8		16.7	7.3		18.6	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4		0.9	0.2		4.4	0.1		63.9	0.0	
Delay (s)	14.0	14.6		15.2	14.1		21.1	7.4		82.5	8.2	
Level of Service	B	B		B	B		C	A		F	A	
Approach Delay (s)		14.4			14.6			8.9			13.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM Average Control Delay			11.5			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			38.2			Sum of lost time (s)			13.6			
Intersection Capacity Utilization			51.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: 4TH Street & Chester Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	140	168	131	98	34	114	503	97	30	788	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flt	1.00	0.92		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1710		1770	1791		1770	3454		1770	3512	
Flt Permitted	0.67	1.00		0.39	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1239	1710		729	1791		1770	3454		1770	3512	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	152	183	142	107	37	124	547	105	33	857	46
RTOR Reduction (vph)	0	75	0	0	21	0	0	20	0	0	6	0
Lane Group Flow (vph)	33	260	0	142	123	0	124	632	0	33	897	0
Turn Type	Perm		Perm			Prot			Prot			
Protected Phases	4		8			5			2			
Permitted Phases	4		8						1			
Actuated Green, G (s)	13.7	13.7		13.7	13.7		5.2	22.6		1.9	19.3	
Effective Green, g (s)	13.7	13.7		13.7	13.7		5.2	22.6		1.9	19.3	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.10	0.44		0.04	0.37	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	328	452		193	474		178	1507		65	1309	
v/s Ratio Prot		0.15			0.07		c0.07	c0.18		0.02	c0.26	
v/s Ratio Perm	0.03			c0.19								
v/c Ratio	0.10	0.58		0.74	0.26		0.70	0.42		0.51	0.69	
Uniform Delay, d1	14.4	16.5		17.4	15.0		22.5	10.1		24.5	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.1		11.8	0.1		9.2	0.1		2.3	1.2	
Delay (s)	14.4	17.6		29.2	15.1		31.7	10.1		26.8	14.9	
Level of Service	B	B		C	B		C	B		C	B	
Approach Delay (s)		17.3			22.1			13.6			15.3	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM Average Control Delay	15.9			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	51.8			Sum of lost time (s)			18.6					
Intersection Capacity Utilization	69.5%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: 4TH Street & P Street

























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	58	38	32	65	28	39	356	22	25	231	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1846		1770	1838	
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.59	1.00		0.52	1.00	
Satd. Flow (perm)	1863	1863	1583	1863	1863	1583	1100	1846		971	1838	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	63	41	35	71	30	42	387	24	27	251	24
RTOR Reduction (vph)	0	0	35	0	0	26	0	5	0	0	7	0
Lane Group Flow (vph)	30	63	6	35	71	4	42	406	0	27	268	0
Turn Type	Perm		Perm	Perm	Perm		Perm			Perm		
Protected Phases	4				8			2			6	
Permitted Phases	4		4	8	8		2			6		
Actuated Green, G (s)	2.9	2.9	2.9	2.9	2.9	2.9	7.7	7.7		7.7	7.7	
Effective Green, g (s)	2.9	2.9	2.9	2.9	2.9	2.9	7.7	7.7		7.7	7.7	
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.38	0.38		0.38	0.38	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	270	270	230	270	270	230	424	711		374	708	
v/s Ratio Prot		0.03			c0.04			c0.22			0.15	
v/s Ratio Perm	0.02		0.00	0.02		0.00	0.04			0.03		
v/c Ratio	0.11	0.23	0.03	0.13	0.26	0.02	0.10	0.57		0.07	0.38	
Uniform Delay, d1	7.4	7.6	7.3	7.5	7.6	7.3	3.9	4.8		3.9	4.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2	0.0	0.1	0.2	0.0	0.0	0.7		0.0	0.1	
Delay (s)	7.5	7.7	7.4	7.5	7.8	7.3	4.0	5.5		3.9	4.5	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		7.6			7.6			5.4			4.5	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay	5.7			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	20.0			Sum of lost time (s)			9.4					
Intersection Capacity Utilization	43.8%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: 4TH Street & P Street




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	104	52	34	125	20	35	356	40	32	521	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1835		1770	1838	
Flt Permitted	0.71	1.00	1.00	0.71	1.00	1.00	0.35	1.00		0.51	1.00	
Satd. Flow (perm)	1331	1863	1583	1331	1863	1583	649	1835		954	1838	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	113	57	37	136	22	38	387	43	35	566	54
RTOR Reduction (vph)	0	0	47	0	0	18	0	6	0	0	6	0
Lane Group Flow (vph)	65	113	10	37	136	4	38	424	0	35	614	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	5.6	5.6	5.6	5.6	5.6	5.6	15.8	15.8		15.8	15.8	
Effective Green, g (s)	5.6	5.6	5.6	5.6	5.6	5.6	15.8	15.8		15.8	15.8	
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.51	0.51		0.51	0.51	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	242	339	288	242	339	288	333	941		489	943	
v/s Ratio Prot		0.06			c0.07			0.23			c0.33	
v/s Ratio Perm	0.05		0.01	0.03		0.00	0.06			0.04		
v/c Ratio	0.27	0.33	0.04	0.15	0.40	0.01	0.11	0.45		0.07	0.65	
Uniform Delay, d1	10.8	11.0	10.4	10.6	11.1	10.3	3.9	4.7		3.8	5.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.0	0.1	0.3	0.0	0.1	0.1		0.0	1.2	
Delay (s)	11.1	11.2	10.4	10.7	11.4	10.3	3.9	4.9		3.8	6.7	
Level of Service	B	B	B	B	B	B	A	A		A	A	
Approach Delay (s)		11.0			11.2			4.8			6.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			7.3			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			30.8			Sum of lost time (s)				9.4		
Intersection Capacity Utilization			51.9%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: 4TH Street & S Union ave




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	69	54	91	76	56	66	1763	39	47	1478	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.93			0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1740			1764		1770	5069		1770	5037	
Flt Permitted	0.53	1.00			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	983	1740			1453		1770	5069		1770	5037	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	75	59	99	83	61	72	1916	42	51	1607	108
RTOR Reduction (vph)	0	42	0	0	18	0	0	2	0	0	6	0
Lane Group Flow (vph)	60	92	0	0	225	0	72	1956	0	51	1709	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases	4			8			5			1		
Permitted Phases	4			8						6		
Actuated Green, G (s)	12.6	12.6			12.9		4.2	33.6		3.9	33.3	
Effective Green, g (s)	12.6	12.6			12.9		4.2	33.6		3.9	33.3	
Actuated g/C Ratio	0.20	0.20			0.20		0.07	0.53		0.06	0.53	
Clearance Time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Vehicle Extension (s)	0.2	0.2			0.2		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	196	347			297		118	2695		109	2654	
v/s Ratio Prot		0.05					c0.04	c0.39		0.03	0.34	
v/s Ratio Perm	0.06				c0.15							
v/c Ratio	0.31	0.26			0.76		0.61	0.73		0.47	0.64	
Uniform Delay, d1	21.6	21.4			23.7		28.7	11.3		28.6	10.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1			9.4		6.4	1.4		1.2	0.8	
Delay (s)	21.9	21.5			33.0		35.1	12.6		29.8	11.5	
Level of Service	C	C			C		D	B		C	B	
Approach Delay (s)		21.6			33.0			13.4			12.1	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay	14.4			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.66											
Actuated Cycle Length (s)	63.2			Sum of lost time (s)			7.9					
Intersection Capacity Utilization	74.0%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: 4TH Street & S Union ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	106	36	104	54	68	74	1739	67	169	2110	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.96			0.96		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1792			1747		1770	5057		1770	5061	
Flt Permitted	0.52	1.00			0.70		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	972	1792			1250		1770	5057		1770	5061	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	115	39	113	59	74	80	1890	73	184	2293	76
RTOR Reduction (vph)	0	15	0	0	19	0	0	3	0	0	3	0
Lane Group Flow (vph)	84	139	0	0	227	0	80	1960	0	184	2366	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases	4			8			5			2		
Permitted Phases	4			8						1		
Actuated Green, G (s)	15.1	15.1			15.4		6.1	40.5		11.2	45.6	
Effective Green, g (s)	15.1	15.1			15.4		6.1	40.5		11.2	45.6	
Actuated g/C Ratio	0.19	0.19			0.19		0.08	0.51		0.14	0.57	
Clearance Time (s)	4.5	4.5			4.2		3.7	4.9		3.7	4.9	
Vehicle Extension (s)	0.2	0.2			0.2		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	184	339			241		135	2563		248	2888	
v/s Ratio Prot		0.08					0.05	0.39		c0.10	c0.47	
v/s Ratio Perm	0.09				c0.18							
v/c Ratio	0.46	0.41			0.94		0.59	0.76		0.74	0.82	
Uniform Delay, d1	28.8	28.5			31.8		35.7	15.9		33.0	13.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3			41.3		4.6	1.8		10.0	2.3	
Delay (s)	29.4	28.8			73.1		40.3	17.6		43.0	16.1	
Level of Service	C	C			E		D	B		D	B	
Approach Delay (s)		29.0			73.1			18.5			18.0	
Approach LOS		C			E			B			B	
Intersection Summary												
HCM Average Control Delay	21.4			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.81											
Actuated Cycle Length (s)	79.9			Sum of lost time (s)			7.9					
Intersection Capacity Utilization	82.5%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: 8TH Street & Chester Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	26	5	21	26	69	2	707	27	48	339	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.89		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1820		1770	1659		1770	3520		1770	3511	
Flt Permitted	1.00	1.00		1.00	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	1820		1863	1659		1770	3520		1770	3511	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	28	5	23	28	75	2	768	29	52	368	21
RTOR Reduction (vph)	0	5	0	0	68	0	0	3	0	0	5	0
Lane Group Flow (vph)	25	28	0	23	35	0	2	794	0	52	384	0
Turn Type	Perm		Perm			Prot			Prot			
Protected Phases	4		8			5			2			
Permitted Phases	4		8			1			6			
Actuated Green, G (s)	3.0	3.0		3.0	3.0		1.5	15.9		1.7	16.1	
Effective Green, g (s)	3.0	3.0		3.0	3.0		1.5	15.9		1.7	16.1	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.04	0.46		0.05	0.47	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	163	160		163	146		78	1636		88	1653	
v/s Ratio Prot		0.02			c0.02		0.00	c0.23		c0.03	0.11	
v/s Ratio Perm	0.01			0.01								
v/c Ratio	0.15	0.18		0.14	0.24		0.03	0.49		0.59	0.23	
Uniform Delay, d1	14.4	14.5		14.4	14.5		15.7	6.3		15.9	5.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.1	0.3		0.0	0.1		6.9	0.0	
Delay (s)	14.6	14.7		14.6	14.8		15.7	6.4		22.8	5.4	
Level of Service	B	B		B	B		B	A		C	A	
Approach Delay (s)		14.6			14.8			6.4			7.5	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay	7.8			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	34.2			Sum of lost time (s)			13.6					
Intersection Capacity Utilization	44.7%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis



















12: 8TH Street & Chester Ave

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	38	18	58	27	91	15	608	27	84	727	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flt	1.00	0.95		1.00	0.88		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1771		1770	1647		1770	3517		1770	3502	
Flt Permitted	0.80	1.00		0.80	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1490	1771		1490	1647		1770	3517		1770	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	41	20	63	29	99	16	661	29	91	790	59
RTOR Reduction (vph)	0	17	0	0	86	0	0	4	0	0	7	0
Lane Group Flow (vph)	43	44	0	63	42	0	16	686	0	91	842	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases			4			8	5		2	1		6
Permitted Phases	4			8								
Actuated Green, G (s)	5.0	5.0		5.0	5.0		1.1	15.8		3.3	18.0	
Effective Green, g (s)	5.0	5.0		5.0	5.0		1.1	15.8		3.3	18.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.03	0.42		0.09	0.48	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	198	235		198	218		52	1474		155	1672	
v/s Ratio Prot		0.02			0.03		0.01	c0.20		0.05	c0.24	
v/s Ratio Perm	0.03			c0.04								
v/c Ratio	0.22	0.19		0.32	0.19		0.31	0.47		0.59	0.50	
Uniform Delay, d1	14.6	14.5		14.8	14.6		17.9	7.9		16.5	6.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.3	0.2		1.2	0.1		3.6	0.1	
Delay (s)	14.8	14.7		15.1	14.7		19.2	8.0		20.2	6.9	
Level of Service	B	B		B	B		B	A		C	A	
Approach Delay (s)		14.7			14.9			8.2			8.2	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay			9.2			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			37.7			Sum of lost time (s)				9.6		
Intersection Capacity Utilization			48.0%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 13: 8Th Street & P Street



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	48	35	3	9	46	43	13	392	11	35	198	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	38	3	10	50	47	14	426	12	38	215	14
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	93	107	14	438	38	229						
Volume Left (vph)	52	10	14	0	38	0						
Volume Right (vph)	3	47	0	12	0	14						
Hadj (s)	0.12	-0.21	0.53	0.01	0.53	-0.01						
Departure Headway (s)	6.1	5.7	6.0	5.5	6.2	5.6						
Degree Utilization, x	0.16	0.17	0.02	0.66	0.07	0.36						
Capacity (veh/h)	520	551	581	637	555	612						
Control Delay (s)	10.2	9.9	7.9	17.4	8.4	10.5						
Approach Delay (s)	10.2	9.9	17.1		10.2							
Approach LOS	B	A	C		B							
Intersection Summary												
Delay			13.6									
HCM Level of Service			B									
Intersection Capacity Utilization			46.0%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: 8Th Street & P Street
























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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	42	58	21	32	65	56	17	412	22	71	578	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	63	23	35	71	61	18	448	24	77	628	72
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	132	166	18	472	77	700						
Volume Left (vph)	46	35	18	0	77	0						
Volume Right (vph)	23	61	0	24	0	72						
Hadj (s)	0.00	-0.14	0.53	0.00	0.53	-0.04						
Departure Headway (s)	7.5	7.2	7.1	6.6	7.0	6.5						
Degree Utilization, x	0.27	0.33	0.04	0.87	0.15	1.26						
Capacity (veh/h)	446	463	492	537	498	563						
Control Delay (s)	13.3	13.8	9.2	37.3	10.1	149.0						
Approach Delay (s)	13.3	13.8	36.2		135.2							
Approach LOS	B	B	E		F							
Intersection Summary												
Delay			81.1									
HCM Level of Service			F									
Intersection Capacity Utilization			58.8%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

14: California Avenue & Real Rd
























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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	1128	91	116	919	194	134	75	344	264	343	1007
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3		3.7	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00	0.88	1.00	0.95	0.95
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5028		1770	5085	1583	1770	1863	2787	1770	1633	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5028		1770	5085	1583	1770	1863	2787	1770	1633	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	1226	99	126	999	211	146	82	374	287	373	1095
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	343	0	32	167
Lane Group Flow (vph)	124	1317	0	126	999	211	146	82	31	287	735	534
Turn Type	Prot			Prot		Free	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						Free			3			4
Actuated Green, G (s)	10.6	33.7		8.3	31.4	120.0	10.0	10.0	10.0	51.0	51.0	51.0
Effective Green, g (s)	10.6	33.7		8.3	31.4	120.0	10.0	10.0	10.0	51.0	51.0	51.0
Actuated g/C Ratio	0.09	0.28		0.07	0.26	1.00	0.08	0.08	0.08	0.42	0.42	0.42
Clearance Time (s)	3.7	5.3		3.7	5.3		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.1		2.0	4.5		4.5	4.5	4.5	7.1	7.1	7.1
Lane Grp Cap (vph)	156	1412		122	1331	1583	148	155	232	752	694	639
v/s Ratio Prot	0.07	c0.26		c0.07	0.20		c0.08	0.04		0.16	c0.45	
v/s Ratio Perm						0.13			0.01			0.36
v/c Ratio	0.79	0.93		1.03	0.75	0.13	0.99	0.53	0.13	0.38	1.06	0.84
Uniform Delay, d1	53.6	42.0		55.8	40.7	0.0	54.9	52.7	51.0	23.7	34.5	30.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.3	11.6		90.5	2.7	0.2	69.6	5.1	0.5	1.2	51.1	11.2
Delay (s)	76.0	53.6		146.4	43.4	0.2	124.5	57.9	51.4	24.8	85.6	42.0
Level of Service	E	D		F	D	A	F	E	D	C	F	D
Approach Delay (s)		55.5			46.3			70.1			58.2	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM Average Control Delay		55.8				HCM Level of Service		E				
HCM Volume to Capacity ratio		1.01										
Actuated Cycle Length (s)		120.0				Sum of lost time (s)		17.0				
Intersection Capacity Utilization		90.7%				ICU Level of Service		E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: California Avenue & Real Rd























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	500	1480	243	188	1143	571	146	125	291	291	546	1193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3		3.7	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00	0.88	1.00	0.95	0.95
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4978		1770	5085	1583	1770	1863	2787	1770	1662	1504
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4978		1770	5085	1583	1770	1863	2787	1770	1662	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	1609	264	204	1242	621	159	136	316	316	593	1297
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	291	0	17	298
Lane Group Flow (vph)	543	1857	0	204	1242	621	159	136	25	316	978	597
Turn Type	Prot			Prot		Free	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						Free			3			4
Actuated Green, G (s)	27.3	42.7		13.3	28.7	140.0	11.0	11.0	11.0	56.0	56.0	56.0
Effective Green, g (s)	27.3	42.7		13.3	28.7	140.0	11.0	11.0	11.0	56.0	56.0	56.0
Actuated g/C Ratio	0.20	0.30		0.10	0.20	1.00	0.08	0.08	0.08	0.40	0.40	0.40
Clearance Time (s)	3.7	5.3		3.7	5.3		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.1		2.0	4.5		4.5	4.5	4.5	7.1	7.1	7.1
Lane Grp Cap (vph)	345	1518		168	1042	1583	139	146	219	708	665	602
v/s Ratio Prot	c0.31	c0.37		0.12	c0.24		c0.09	0.07		0.18	c0.59	
v/s Ratio Perm						0.39			0.01			0.40
v/c Ratio	1.57	1.22		1.21	1.19	0.39	1.14	0.93	0.11	0.45	1.47	0.99
Uniform Delay, d1	56.4	48.6		63.4	55.6	0.0	64.5	64.1	60.0	30.7	42.0	41.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	271.9	106.6		138.7	96.0	0.7	120.2	55.1	0.4	1.6	219.7	34.8
Delay (s)	328.2	155.3		202.0	151.7	0.7	184.7	119.2	60.4	32.3	261.7	76.6
Level of Service	F	F		F	F	A	F	F	E	C	F	E
Approach Delay (s)		194.1			111.3			105.8			153.7	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		151.1				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.34										
Actuated Cycle Length (s)		140.0				Sum of lost time (s)		11.7				
Intersection Capacity Utilization		125.3%				ICU Level of Service		H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: California Ave & parking lot




























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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1213	1003	0	1186	23	479	16	653	31	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9	4.0		5.3	5.3	4.6	4.6	4.6	3.7		3.7
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00	0.95	0.95	1.00	1.00		1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	0.96	1.00	0.95		1.00
Satd. Flow (prot)	1770	5085	1583		5085	1583	1681	1690	1583	1770		1583
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	0.96	1.00	0.63		1.00
Satd. Flow (perm)	1770	5085	1583		5085	1583	1681	1690	1583	1183		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1318	1090	0	1289	25	521	17	710	34	0	37
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	87	0	0	35
Lane Group Flow (vph)	11	1318	1090	0	1289	14	271	267	623	34	0	2
Turn Type	Prot		Free			Prot	Split		Perm	custom		custom
Protected Phases	5	2			6	6	3	3				
Permitted Phases			Free						3	4		4
Actuated Green, G (s)	1.2	39.3	94.9		34.0	34.0	36.1	36.1	36.1	6.3		6.3
Effective Green, g (s)	1.2	39.3	94.9		34.0	34.0	36.1	36.1	36.1	6.3		6.3
Actuated g/C Ratio	0.01	0.41	1.00		0.36	0.36	0.38	0.38	0.38	0.07		0.07
Clearance Time (s)	3.7	4.9			5.3	5.3	4.6	4.6	4.6	3.7		3.7
Vehicle Extension (s)	2.0	5.1			4.2	4.2	5.0	5.0	5.0	1.5		1.5
Lane Grp Cap (vph)	22	2106	1583		1822	567	639	643	602	79		105
v/s Ratio Prot	0.01	0.26			0.25	0.01	0.16	0.16				
v/s Ratio Perm			c0.69						c0.39	0.03		0.00
v/c Ratio	0.50	0.63	0.69		0.71	0.02	0.42	0.42	1.04	0.43		0.02
Uniform Delay, d1	46.6	22.0	0.0		26.2	19.7	21.7	21.6	29.4	42.6		41.4
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	6.4	0.8	2.5		1.4	0.0	1.0	0.9	46.1	1.4		0.0
Delay (s)	52.9	22.8	2.5		27.6	19.7	22.7	22.5	75.5	43.9		41.5
Level of Service	D	C	A		C	B	C	C	E	D		D
Approach Delay (s)		13.8			27.4			52.7			42.6	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay			27.4		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			94.9		Sum of lost time (s)				4.6			
Intersection Capacity Utilization			78.5%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: California Ave & parking lot

























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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Volume (vph)	69	1127	1202	0	2096	68	301	9	564	55	0	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9	4.0		5.3	5.3	4.6	4.6	4.6	3.7		3.7
Lane Util. Factor	1.00	0.91	1.00		0.91	1.00	0.95	0.95	1.00	1.00		1.00
Flt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	0.96	1.00	0.95		1.00
Satd. Flow (prot)	1770	5085	1583		5085	1583	1681	1690	1583	1770		1583
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	0.96	1.00	0.64		1.00
Satd. Flow (perm)	1770	5085	1583		5085	1583	1681	1690	1583	1200		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	1225	1307	0	2278	74	327	10	613	60	0	80
RTOR Reduction (vph)	0	0	0	0	0	14	0	0	48	0	0	75
Lane Group Flow (vph)	75	1225	1307	0	2278	60	167	170	565	60	0	5
Turn Type	Prot		Free			Prot	Split		Perm	custom		custom
Protected Phases	5	2			6	6	3	3				
Permitted Phases			Free						3	4		4
Actuated Green, G (s)	8.0	75.8	144.6		63.7	63.7	47.4	47.4	47.4	8.2		8.2
Effective Green, g (s)	8.0	75.8	144.6		63.7	63.7	47.4	47.4	47.4	8.2		8.2
Actuated g/C Ratio	0.06	0.52	1.00		0.44	0.44	0.33	0.33	0.33	0.06		0.06
Clearance Time (s)	3.7	4.9			5.3	5.3	4.6	4.6	4.6	3.7		3.7
Vehicle Extension (s)	2.0	5.1			4.2	4.2	5.0	5.0	5.0	1.5		1.5
Lane Grp Cap (vph)	98	2666	1583		2240	697	551	554	519	68		90
v/s Ratio Prot	0.04	0.24			c0.45	0.04	0.10	0.10				
v/s Ratio Perm			c0.83						c0.36	0.05		0.00
v/c Ratio	0.77	0.46	0.83		1.02	0.09	0.30	0.31	1.09	0.88		0.05
Uniform Delay, d1	67.4	21.6	0.0		40.4	23.5	36.3	36.3	48.6	67.7		64.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	26.8	0.3	5.1		23.4	0.1	0.7	0.7	65.5	68.1		0.1
Delay (s)	94.1	21.8	5.1		63.8	23.6	36.9	37.0	114.1	135.8		64.6
Level of Service	F	C	A		E	C	D	D	F	F		E
Approach Delay (s)		15.5			62.6			86.7			95.1	
Approach LOS		B			E			F			F	
Intersection Summary												
HCM Average Control Delay			46.8		HCM Level of Service					D		
HCM Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			144.6		Sum of lost time (s)					9.9		
Intersection Capacity Utilization			72.3%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: California Ave & OAK STREET

























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	765	977	116	49	522	118	229	485	74	90	210	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	5085	1583	3433	4985		1770	3203	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	5085	1583	3433	4985		1770	3203	1441
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	832	1062	126	53	567	128	249	527	80	98	228	296
RTOR Reduction (vph)	0	0	68	0	0	99	0	16	0	0	63	140
Lane Group Flow (vph)	832	1062	58	53	567	29	249	591	0	98	298	23
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	3	8		7	4		6	6		2	2	
Permitted Phases			8			4						2
Actuated Green, G (s)	30.0	40.9	40.9	7.1	18.0	18.0	18.0	18.0		14.5	14.5	14.5
Effective Green, g (s)	30.0	40.9	40.9	7.1	18.0	18.0	18.0	18.0		14.5	14.5	14.5
Actuated g/C Ratio	0.30	0.41	0.41	0.07	0.18	0.18	0.18	0.18		0.14	0.14	0.14
Clearance Time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	1.0	2.0	2.0	0.5	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1024	1439	644	242	910	283	614	892		255	462	208
v/s Ratio Prot	c0.24	c0.30		0.02	c0.11		0.07	c0.12		0.06	c0.09	
v/s Ratio Perm			0.04			0.02						0.02
v/c Ratio	0.81	0.74	0.09	0.22	0.62	0.10	0.41	0.66		0.38	0.64	0.11
Uniform Delay, d1	32.7	25.3	18.4	44.1	38.2	34.6	36.6	38.5		39.0	40.6	37.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.7	1.7	0.0	0.2	1.0	0.1	0.2	1.4		0.4	2.3	0.1
Delay (s)	37.4	27.0	18.4	44.3	39.1	34.6	36.7	39.9		39.4	42.9	37.5
Level of Service	D	C	B	D	D	C	D	D		D	D	D
Approach Delay (s)		30.8			38.7			39.0			41.0	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay			35.3			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			100.6			Sum of lost time (s)			15.2			
Intersection Capacity Utilization			66.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: California Ave & OAK STREET

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	760	206	169	923	104	278	527	56	134	746	685
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.96	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	5085	1583	3433	5012		1770	3264	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	5085	1583	3433	5012		1770	3264	1441
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	547	826	224	184	1003	113	302	573	61	146	811	745
RTOR Reduction (vph)	0	0	154	0	0	44	0	10	0	0	21	263
Lane Group Flow (vph)	547	826	70	184	1003	69	302	624	0	146	1058	214
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	3	8		7	4		6	6		2	2	
Permitted Phases			8			4						2
Actuated Green, G (s)	20.4	34.4	34.4	12.2	26.2	26.2	22.1	22.1		40.7	40.7	40.7
Effective Green, g (s)	20.4	34.4	34.4	12.2	26.2	26.2	22.1	22.1		40.7	40.7	40.7
Actuated g/C Ratio	0.16	0.27	0.27	0.09	0.20	0.20	0.17	0.17		0.31	0.31	0.31
Clearance Time (s)	4.6	4.9	4.9	4.6	4.9	4.9	5.3	5.3		5.3	5.3	5.3
Vehicle Extension (s)	1.0	2.0	2.0	0.5	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	541	940	421	323	1029	320	586	855		556	1026	453
v/s Ratio Prot	c0.16	0.23		0.05	c0.20		0.09	c0.12		0.08	c0.32	
v/s Ratio Perm			0.04			0.04						0.15
v/c Ratio	1.01	0.88	0.17	0.57	0.97	0.22	0.52	0.73		0.26	1.03	0.47
Uniform Delay, d1	54.6	45.6	36.5	56.1	51.3	43.1	48.8	50.9		33.2	44.4	35.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	41.5	9.1	0.1	1.4	21.8	0.1	0.3	2.7		0.1	36.3	0.3
Delay (s)	96.0	54.7	36.6	57.5	73.2	43.2	49.1	53.5		33.3	80.7	36.0
Level of Service	F	D	D	E	E	D	D	D		C	F	D
Approach Delay (s)		66.3			68.4			52.1			64.1	
Approach LOS		E			E			D			E	





















Intersection Summary

HCM Average Control Delay	63.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	129.5	Sum of lost time (s)	20.1
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

17: California Ave & Campus Way





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	284	853	49	50	482	135	55	69	95	30	40	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.91		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	4918		1770	1701		1770	1632	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3511		1770	4918		1770	1701		1770	1632	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	309	927	53	54	524	147	60	75	103	33	43	204
RTOR Reduction (vph)	0	4	0	0	60	0	0	73	0	0	178	0
Lane Group Flow (vph)	309	976	0	54	611	0	60	105	0	33	69	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	14.1	25.8		3.5	15.2		4.8	9.9		2.1	7.7	
Effective Green, g (s)	14.1	25.8		3.5	15.2		4.8	9.9		2.1	7.7	
Actuated g/C Ratio	0.24	0.43		0.06	0.26		0.08	0.17		0.04	0.13	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Vehicle Extension (s)	1.5	2.0		1.0	2.0		1.5	1.5		1.0	1.5	
Lane Grp Cap (vph)	419	1520		104	1254		143	283		62	211	
v/s Ratio Prot	c0.17	c0.28		0.03	0.12		0.03	c0.06		0.02	c0.04	
v/s Ratio Perm												
v/c Ratio	0.74	0.64		0.52	0.49		0.42	0.37		0.53	0.33	
Uniform Delay, d1	21.0	13.3		27.2	18.9		26.1	22.1		28.3	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	0.7		1.8	0.1		0.7	0.3		4.3	0.3	
Delay (s)	26.8	14.0		29.0	19.0		26.8	22.4		32.6	23.9	
Level of Service	C	B		C	B		C	C		C	C	
Approach Delay (s)		17.0			19.7			23.5			25.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay		19.3			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		59.6			Sum of lost time (s)			8.5				
Intersection Capacity Utilization		63.7%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: California Ave & Campus Way

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	753	63	85	1101	10	61	12	57	3	25	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	5078		1770	1632		1770	1660	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3498		1770	5078		1770	1632		1770	1660	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	818	68	92	1197	11	66	13	62	3	27	71
RTOR Reduction (vph)	0	7	0	0	1	0	0	52	0	0	65	0
Lane Group Flow (vph)	83	879	0	92	1207	0	66	23	0	3	33	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.9	21.2		4.9	21.2		5.1	8.3		0.9	4.6	
Effective Green, g (s)	4.9	21.2		4.9	21.2		5.1	8.3		0.9	4.6	
Actuated g/C Ratio	0.09	0.40		0.09	0.40		0.10	0.15		0.02	0.09	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	4.5		4.5	4.5	
Vehicle Extension (s)	1.5	2.0		1.0	2.0		1.5	1.5		1.0	1.5	
Lane Grp Cap (vph)	162	1384		162	2008		168	253		30	142	
v/s Ratio Prot	0.05	c0.25		c0.05	0.24		c0.04	c0.01		0.00	c0.02	
v/s Ratio Perm												
v/c Ratio	0.51	0.64		0.57	0.60		0.39	0.09		0.10	0.23	
Uniform Delay, d1	23.2	13.1		23.3	12.8		22.8	19.4		26.0	22.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.7		2.7	0.4		0.6	0.1		0.5	0.3	
Delay (s)	24.3	13.8		26.0	13.2		23.3	19.5		26.5	23.2	
Level of Service	C	B		C	B		C	B		C	C	
Approach Delay (s)		14.7			14.1			21.3			23.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay		15.1					HCM Level of Service		B			
HCM Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		53.6					Sum of lost time (s)		22.3			
Intersection Capacity Utilization		49.4%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: California Ave & Oleander Ave







10/12/2010

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑	
Volume (vph)	1015	19	98	488	45	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0	5.0	4.0	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	5071		1770	5085	1676	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	5071		1770	5085	1676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1103	21	107	530	49	78
RTOR Reduction (vph)	2	0	0	0	68	0
Lane Group Flow (vph)	1122	0	107	530	59	0
Turn Type			Prot			
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	17.5		3.4	24.9	4.8	
Effective Green, g (s)	17.5		3.4	24.9	4.8	
Actuated g/C Ratio	0.45		0.09	0.64	0.12	
Clearance Time (s)	5.0		4.0	5.0	4.0	
Vehicle Extension (s)	4.0		1.0	4.0	1.5	
Lane Grp Cap (vph)	2293		156	3272	208	
v/s Ratio Prot	c0.22		c0.06	0.10	c0.04	
v/s Ratio Perm						
v/c Ratio	0.49		0.69	0.16	0.28	
Uniform Delay, d1	7.5		17.1	2.7	15.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		9.5	0.0	0.3	
Delay (s)	7.7		26.7	2.8	15.7	
Level of Service	A		C	A	B	
Approach Delay (s)	7.7			6.8	15.7	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay		7.9		HCM Level of Service		A
HCM Volume to Capacity ratio		0.48				
Actuated Cycle Length (s)		38.7		Sum of lost time (s)		13.0
Intersection Capacity Utilization		43.2%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

18: California Ave & Oleander Ave





















10/12/2010

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	
Volume (vph)	754	68	107	1104	35	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		4.0	5.0	4.0	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	0.99		1.00	1.00	0.90	
Flt Protected	1.00		0.95	1.00	0.99	
Satd. Flow (prot)	5022		1770	5085	1661	
Flt Permitted	1.00		0.95	1.00	0.99	
Satd. Flow (perm)	5022		1770	5085	1661	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	820	74	116	1200	38	92
RTOR Reduction (vph)	12	0	0	0	81	0
Lane Group Flow (vph)	882	0	116	1200	49	0
Turn Type			Prot			
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	16.7		4.8	25.5	4.6	
Effective Green, g (s)	16.7		4.8	25.5	4.6	
Actuated g/C Ratio	0.43		0.12	0.65	0.12	
Clearance Time (s)	5.0		4.0	5.0	4.0	
Vehicle Extension (s)	4.0		1.0	4.0	1.5	
Lane Grp Cap (vph)	2145		217	3316	195	
v/s Ratio Prot	0.18		c0.07	c0.24	c0.03	
v/s Ratio Perm						
v/c Ratio	0.41		0.53	0.36	0.25	
Uniform Delay, d1	7.8		16.1	3.1	15.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		1.3	0.1	0.2	
Delay (s)	8.0		17.4	3.2	15.9	
Level of Service	A		B	A	B	
Approach Delay (s)	8.0			4.4	15.9	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay		6.4		HCM Level of Service		A
HCM Volume to Capacity ratio		0.34				
Actuated Cycle Length (s)		39.1		Sum of lost time (s)		8.0
Intersection Capacity Utilization		40.0%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

19: California Ave & H Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	847	60	155	462	60	90	468	136	80	220	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5035		1770	4998		1770	3420		1770	3366	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5035		1770	4998		1770	3420		1770	3366	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	921	65	168	502	65	98	509	148	87	239	116
RTOR Reduction (vph)	0	8	0	0	17	0	0	33	0	0	75	0
Lane Group Flow (vph)	118	978	0	168	550	0	98	624	0	87	280	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.6	20.8		10.2	19.4		11.2	20.2		6.5	15.5	
Effective Green, g (s)	11.6	20.8		10.2	19.4		11.2	20.2		6.5	15.5	
Actuated g/C Ratio	0.15	0.28		0.14	0.26		0.15	0.27		0.09	0.21	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	272	1387		239	1284		263	915		152	691	
v/s Ratio Prot	0.07	c0.19		c0.09	0.11		0.06	c0.18		c0.05	0.08	
v/s Ratio Perm												
v/c Ratio	0.43	0.71		0.70	0.43		0.37	0.68		0.57	0.40	
Uniform Delay, d1	29.0	24.6		31.2	23.4		29.0	24.8		33.2	26.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.4		7.4	0.1		0.3	1.7		3.2	0.1	
Delay (s)	29.4	25.9		38.6	23.5		29.3	26.5		36.4	26.1	
Level of Service	C	C		D	C		C	C		D	C	
Approach Delay (s)		26.3			27.0			26.8			28.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		26.9			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		75.5			Sum of lost time (s)			17.8				
Intersection Capacity Utilization		65.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

19: California Ave & H Street























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	866	81	279	893	66	77	491	353	118	709	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Flt	1.00	0.99		1.00	0.99		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5020		1770	5033		1770	3317		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5020		1770	5033		1770	3317		1770	3467	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	941	88	303	971	72	84	534	384	128	771	122
RTOR Reduction (vph)	0	12	0	0	9	0	0	149	0	0	14	0
Lane Group Flow (vph)	167	1017	0	303	1034	0	84	769	0	128	879	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.5	18.3		14.1	20.9		9.3	28.2		8.7	27.6	
Effective Green, g (s)	11.5	18.3		14.1	20.9		9.3	28.2		8.7	27.6	
Actuated g/C Ratio	0.13	0.21		0.16	0.24		0.11	0.32		0.10	0.32	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	234	1055		287	1208		189	1074		177	1099	
v/s Ratio Prot	0.09	c0.20		c0.17	0.21		0.05	c0.23		0.07	c0.25	
v/s Ratio Perm												
v/c Ratio	0.71	0.96		1.06	0.86		0.44	0.72		0.72	0.80	
Uniform Delay, d1	36.2	34.1		36.5	31.7		36.5	25.9		38.0	27.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.3	19.4		68.6	5.9		0.6	1.9		11.7	4.0	
Delay (s)	44.5	53.4		105.1	37.6		37.1	27.8		49.7	31.2	
Level of Service	D	D		F	D		D	C		D	C	
Approach Delay (s)		52.2			52.8			28.6			33.6	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM Average Control Delay			43.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			87.1			Sum of lost time (s)			13.8			
Intersection Capacity Utilization			82.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

20: California Ave & Chester Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	354	616	45	63	358	58	102	492	149	72	305	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3503		3433	4979		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3503		3433	4979		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	385	670	49	68	389	63	111	535	162	78	332	138
RTOR Reduction (vph)	0	6	0	0	29	0	0	0	123	0	0	113
Lane Group Flow (vph)	385	713	0	68	423	0	111	535	39	78	332	25
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	14.5	22.0		2.8	10.3		8.5	15.0	15.0	5.0	11.5	11.5
Effective Green, g (s)	14.5	22.0		2.8	10.3		8.5	15.0	15.0	5.0	11.5	11.5
Actuated g/C Ratio	0.23	0.35		0.04	0.17		0.14	0.24	0.24	0.08	0.18	0.18
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	799	1237		154	823		241	852	381	142	653	292
v/s Ratio Prot	0.11	c0.20		0.02	c0.08		c0.06	c0.15		0.04	0.09	
v/s Ratio Perm									0.02			0.02
v/c Ratio	0.48	0.58		0.44	0.51		0.46	0.63	0.10	0.55	0.51	0.09
Uniform Delay, d1	20.7	16.4		29.0	23.7		24.8	21.2	18.4	27.6	22.9	21.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.4		0.7	0.2		0.5	1.0	0.0	2.3	0.2	0.0
Delay (s)	20.8	16.8		29.7	23.9		25.3	22.2	18.5	29.9	23.1	21.1
Level of Service	C	B		C	C		C	C	B	C	C	C
Approach Delay (s)		18.2			24.7			21.9			23.6	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay		21.3					HCM Level of Service		C			
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		62.3					Sum of lost time (s)		18.1			
Intersection Capacity Utilization		54.0%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

20: California Ave & Chester Ave






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	283	737	97	211	874	87	104	449	136	99	688	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Lane Util. Factor	0.97	0.95		0.97	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3478		3433	5016		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3478		3433	5016		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	308	801	105	229	950	95	113	488	148	108	748	286
RTOR Reduction (vph)	0	12	0	0	14	0	0	0	114	0	0	205
Lane Group Flow (vph)	308	894	0	229	1031	0	113	488	34	108	748	81
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)	10.1	24.0		7.5	21.4		5.7	17.3	17.3	10.1	21.7	21.7
Effective Green, g (s)	10.1	24.0		7.5	21.4		5.7	17.3	17.3	10.1	21.7	21.7
Actuated g/C Ratio	0.13	0.31		0.10	0.28		0.07	0.23	0.23	0.13	0.28	0.28
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.9	4.9	4.0	4.9	4.9
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	454	1093		337	1405		132	801	358	234	1005	450
v/s Ratio Prot	0.09	c0.26		0.07	c0.21		c0.06	0.14		c0.06	c0.21	
v/s Ratio Perm									0.02			0.05
v/c Ratio	0.68	0.82		0.68	0.73		0.86	0.61	0.09	0.46	0.74	0.18
Uniform Delay, d1	31.6	24.2		33.3	24.9		34.9	26.5	23.4	30.6	24.8	20.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.2	4.6		4.2	1.7		37.5	0.9	0.0	0.5	2.6	0.1
Delay (s)	34.8	28.8		37.5	26.7		72.4	27.4	23.4	31.2	27.5	20.7
Level of Service	C	C		D	C		E	C	C	C	C	C
Approach Delay (s)		30.3			28.6			33.4			26.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			29.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			76.4			Sum of lost time (s)			22.1			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

21: California Ave & N Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	635	5	17	459	17	4	3	1	6	6	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	0.95	0.95
Frt	1.00	1.00		1.00	0.99		1.00	0.96		1.00	0.93	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5080		1770	5059		1770	1793		1770	1647	1504
Flt Permitted	0.95	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00
Satd. Flow (perm)	1770	5080		1770	5059		1863	1793		1863	1647	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	690	5	18	499	18	4	3	1	7	7	18
RTOR Reduction (vph)	0	1	0	0	4	0	0	1	0	0	6	12
Lane Group Flow (vph)	38	694	0	18	513	0	4	3	0	7	7	0
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	0.6	11.5		0.5	11.4		0.5	0.5		0.5	0.5	0.5
Effective Green, g (s)	0.6	11.5		0.5	11.4		0.5	0.5		0.5	0.5	0.5
Actuated g/C Ratio	0.02	0.45		0.02	0.45		0.02	0.02		0.02	0.02	0.02
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5		1.5	1.5	1.5
Lane Grp Cap (vph)	42	2300		35	2271		37	35		37	32	30
v/s Ratio Prot	c0.02	c0.14		0.01	0.10			0.00			c0.00	
v/s Ratio Perm							0.00			0.00		0.00
v/c Ratio	0.90	0.30		0.51	0.23		0.11	0.09		0.19	0.22	0.01
Uniform Delay, d1	12.4	4.4		12.3	4.3		12.2	12.2		12.3	12.3	12.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	100.1	0.0		5.2	0.0		0.5	0.4		0.9	1.3	0.0
Delay (s)	112.5	4.4		17.5	4.3		12.7	12.6		13.2	13.5	12.2
Level of Service	F	A		B	A		B	B		B	B	B
Approach Delay (s)		10.0			4.8			12.7			13.0	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay		8.0					HCM Level of Service			A		
HCM Volume to Capacity ratio		0.24										
Actuated Cycle Length (s)		25.4					Sum of lost time (s)			8.0		
Intersection Capacity Utilization		31.4%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

21: California Ave & N Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	906	10	12	825	16	1	34	14	15	24	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	0.95	0.95
Frt	1.00	1.00		1.00	1.00		1.00	0.96		1.00	0.98	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5077		1770	5071		1770	1782		1770	1742	1504
Flt Permitted	0.95	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00
Satd. Flow (perm)	1770	5077		1770	5071		1863	1782		1863	1742	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	985	11	13	897	17	1	37	15	16	26	25
RTOR Reduction (vph)	0	1	0	0	2	0	0	14	0	0	3	20
Lane Group Flow (vph)	55	995	0	13	912	0	1	38	0	16	26	2
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	1.6	15.9		0.6	14.9		2.6	2.6		2.6	2.6	2.6
Effective Green, g (s)	1.6	15.9		0.6	14.9		2.6	2.6		2.6	2.6	2.6
Actuated g/C Ratio	0.05	0.50		0.02	0.47		0.08	0.08		0.08	0.08	0.08
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5		1.5	1.5	1.5
Lane Grp Cap (vph)	89	2523		33	2361		151	145		151	142	122
v/s Ratio Prot	c0.03	c0.20		0.01	0.18			c0.02			0.02	
v/s Ratio Perm							0.00			0.01		0.00
v/c Ratio	0.62	0.39		0.39	0.39		0.01	0.26		0.11	0.18	0.01
Uniform Delay, d1	14.9	5.0		15.5	5.6		13.5	13.8		13.6	13.7	13.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.7	0.0		2.8	0.0		0.0	0.4		0.1	0.2	0.0
Delay (s)	23.6	5.1		18.3	5.6		13.5	14.2		13.7	13.9	13.5
Level of Service	C	A		B	A		B	B		B	B	B
Approach Delay (s)		6.0			5.8			14.1			13.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM Average Control Delay		6.4					HCM Level of Service		A			
HCM Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		32.0					Sum of lost time (s)		8.0			
Intersection Capacity Utilization		39.3%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: California Ave & P Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	436	25	126	420	134	31	334	146	36	116	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5044		1770	4901		1770	1778		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5044		1770	4901		1770	1778		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	474	27	137	457	146	34	363	159	39	126	60
RTOR Reduction (vph)	0	8	0	0	71	0	0	19	0	0	0	38
Lane Group Flow (vph)	191	493	0	137	532	0	34	503	0	39	126	22
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.8	12.7		7.9	13.8		2.0	22.8		3.1	23.9	23.9
Effective Green, g (s)	6.8	12.7		7.9	13.8		2.0	22.8		3.1	23.9	23.9
Actuated g/C Ratio	0.11	0.20		0.12	0.22		0.03	0.36		0.05	0.37	0.37
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	364	999		218	1055		55	632		86	695	590
v/s Ratio Prot	0.06	0.10		c0.08	c0.11		0.02	c0.28		c0.02	0.07	
v/s Ratio Perm												0.01
v/c Ratio	0.52	0.49		0.63	0.50		0.62	0.80		0.45	0.18	0.04
Uniform Delay, d1	27.1	22.8		26.7	22.1		30.7	18.6		29.7	13.5	12.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1		4.0	0.1		13.6	6.5		1.4	0.0	0.0
Delay (s)	27.8	23.0		30.7	22.3		44.3	25.0		31.1	13.6	12.8
Level of Service	C	C		C	C		D	C		C	B	B
Approach Delay (s)		24.3			23.8			26.2			16.4	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay			23.8			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			64.1			Sum of lost time (s)			12.6			
Intersection Capacity Utilization			57.4%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

22: California Ave & P Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	237	847	35	245	642	84	27	203	261	145	435	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5055		1770	4997		1770	1706		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5055		1770	4997		1770	1706		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	921	38	266	698	91	29	221	284	158	473	212
RTOR Reduction (vph)	0	5	0	0	19	0	0	56	0	0	0	129
Lane Group Flow (vph)	258	954	0	266	770	0	29	449	0	158	473	83
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	9.0	18.3		11.1	20.4		2.4	26.2		8.1	31.9	31.9
Effective Green, g (s)	9.0	18.3		11.1	20.4		2.4	26.2		8.1	31.9	31.9
Actuated g/C Ratio	0.11	0.23		0.14	0.25		0.03	0.32		0.10	0.39	0.39
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.6		4.0	4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	380	1138		242	1254		52	550		176	731	621
v/s Ratio Prot	0.08	c0.19		c0.15	0.15		0.02	c0.26		c0.09	0.25	
v/s Ratio Perm												0.05
v/c Ratio	0.68	0.84		1.10	0.61		0.56	0.82		0.90	0.65	0.13
Uniform Delay, d1	34.8	30.1		35.1	27.0		38.9	25.3		36.2	20.1	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	5.3		86.9	0.6		7.2	8.6		39.0	1.5	0.0
Delay (s)	38.5	35.4		122.0	27.6		46.1	34.0		75.2	21.6	15.9
Level of Service	D	D		F	C		D	C		E	C	B
Approach Delay (s)		36.0			51.4			34.6			30.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM Average Control Delay		38.9					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		81.3					Sum of lost time (s)		17.6			
Intersection Capacity Utilization		80.1%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: California Ave & Union Ave






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	195	276	61	295	334	164	130	1678	178	177	1354	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Lane Util. Factor	0.97	0.91		0.97	0.91		1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4948		3433	4834		1770	5012		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4948		3433	4834		1770	5012		1770	5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	300	66	321	363	178	141	1824	193	192	1472	264
RTOR Reduction (vph)	0	40	0	0	101	0	0	14	0	0	0	132
Lane Group Flow (vph)	212	326	0	321	440	0	141	2003	0	192	1472	132
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.8	14.6		8.8	16.6		9.5	36.2		10.3	37.0	37.0
Effective Green, g (s)	6.8	14.6		8.8	16.6		9.5	36.2		10.3	37.0	37.0
Actuated g/C Ratio	0.08	0.17		0.10	0.19		0.11	0.41		0.12	0.42	0.42
Clearance Time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Vehicle Extension (s)	2.0	5.2		2.0	5.2		2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	266	825		345	916		192	2071		208	2148	669
v/s Ratio Prot	0.06	0.07		c0.09	c0.09		0.08	c0.40		c0.11	0.29	
v/s Ratio Perm												0.08
v/c Ratio	0.80	0.40		0.93	0.48		0.73	0.97		0.92	0.69	0.20
Uniform Delay, d1	39.7	32.6		39.1	31.7		37.8	25.1		38.3	20.6	15.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.2	0.7		30.8	0.9		11.8	13.1		40.8	1.2	0.3
Delay (s)	54.0	33.3		69.9	32.5		49.6	38.2		79.1	21.8	16.3
Level of Service	D	C		E	C		D	D		E	C	B
Approach Delay (s)		40.9			46.4			38.9			26.7	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay		36.1					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		87.6					Sum of lost time (s)		13.3			
Intersection Capacity Utilization		76.9%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

23: California Ave & Union Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	374	630	208	479	417	158	131	1625	257	283	1853	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Lane Util. Factor	0.97	0.91		0.97	0.91		1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4896		3433	4875		1770	4981		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4896		3433	4875		1770	4981		1770	5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	407	685	226	521	453	172	142	1766	279	308	2014	332
RTOR Reduction (vph)	0	49	0	0	57	0	0	18	0	0	0	94
Lane Group Flow (vph)	407	862	0	521	568	0	142	2027	0	308	2014	238
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	16.3	19.8		16.8	20.3		11.0	46.4		19.3	54.7	54.7
Effective Green, g (s)	16.3	19.8		16.8	20.3		11.0	46.4		19.3	54.7	54.7
Actuated g/C Ratio	0.14	0.16		0.14	0.17		0.09	0.39		0.16	0.46	0.46
Clearance Time (s)	5.2	4.4		5.2	4.4		3.7	4.4		3.7	4.4	4.4
Vehicle Extension (s)	2.0	5.2		2.0	5.2		2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	466	808		481	825		162	1926		285	2318	722
v/s Ratio Prot	0.12	c0.18		c0.15	0.12		0.08	c0.41		c0.17	0.40	
v/s Ratio Perm												0.15
v/c Ratio	0.87	1.07		1.08	0.69		0.88	1.05		1.08	0.87	0.33
Uniform Delay, d1	50.8	50.1		51.6	46.9		53.8	36.8		50.3	29.4	20.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.9	50.9		65.3	3.2		36.5	36.0		76.5	4.1	0.6
Delay (s)	66.8	101.0		116.9	50.1		90.3	72.8		126.8	33.6	21.5
Level of Service	E	F		F	D		F	E		F	C	C
Approach Delay (s)		90.4			80.5			73.9			42.9	
Approach LOS		F			F			E			D	
Intersection Summary												
HCM Average Control Delay		66.6					HCM Level of Service		E			
HCM Volume to Capacity ratio		1.07										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		17.7			
Intersection Capacity Utilization		97.6%					ICU Level of Service		F			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: California Ave & King Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	327	39	86	575	16	105	38	61	24	21	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Flt	1.00	0.98		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	5005		1770	5065			1797	1583		1815	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	5005		1770	5065			1797	1583		1815	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	355	42	93	625	17	114	41	66	26	23	38
RTOR Reduction (vph)	0	17	0	0	3	0	0	0	56	0	0	36
Lane Group Flow (vph)	42	380	0	93	639	0	0	155	10	0	49	2
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases									4			3
Actuated Green, G (s)	1.8	14.2		3.3	16.3			6.8	6.8		2.8	2.8
Effective Green, g (s)	1.8	14.2		3.3	16.3			6.8	6.8		2.8	2.8
Actuated g/C Ratio	0.04	0.31		0.07	0.36			0.15	0.15		0.06	0.06
Clearance Time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	70	1552		128	1803			267	235		111	97
v/s Ratio Prot	0.02	0.08		c0.05	c0.13			c0.09			c0.03	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.60	0.25		0.73	0.35			0.58	0.04		0.44	0.02
Uniform Delay, d1	21.6	11.8		20.8	10.9			18.2	16.7		20.7	20.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	9.5	0.0		15.9	0.0			2.1	0.0		1.0	0.0
Delay (s)	31.2	11.8		36.7	10.9			20.2	16.7		21.8	20.3
Level of Service	C	B		D	B			C	B		C	C
Approach Delay (s)		13.7			14.2			19.2			21.1	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay		15.2				HCM Level of Service			B			
HCM Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		45.8				Sum of lost time (s)		13.8				
Intersection Capacity Utilization		40.5%				ICU Level of Service		A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: California Ave & King Street




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	780	91	129	482	6	69	13	102	6	6	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	1.00
Satd. Flow (prot)	1770	5006		1770	5075			1787	1583		1817	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		0.98	1.00
Satd. Flow (perm)	1770	5006		1770	5075			1787	1583		1817	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	848	99	140	524	7	75	14	111	7	7	26
RTOR Reduction (vph)	0	15	0	0	1	0	0	0	99	0	0	25
Lane Group Flow (vph)	35	932	0	140	530	0	0	89	12	0	14	1
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases									4			3
Actuated Green, G (s)	1.7	18.8		5.6	23.3			5.2	5.2		1.5	1.5
Effective Green, g (s)	1.7	18.8		5.6	23.3			5.2	5.2		1.5	1.5
Actuated g/C Ratio	0.03	0.38		0.11	0.47			0.10	0.10		0.03	0.03
Clearance Time (s)	4.0	4.9		4.6	4.9			4.6	4.6		4.6	4.6
Vehicle Extension (s)	1.0	2.0		1.0	2.0			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	60	1890		199	2374			187	165		55	48
v/s Ratio Prot	0.02	c0.19		c0.08	c0.10			c0.05			c0.01	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.58	0.49		0.70	0.22			0.48	0.07		0.25	0.02
Uniform Delay, d1	23.7	11.9		21.3	7.9			21.0	20.1		23.6	23.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	9.0	0.1		8.9	0.0			0.7	0.1		0.9	0.0
Delay (s)	32.7	11.9		30.2	7.9			21.7	20.2		24.5	23.5
Level of Service	C	B		C	A			C	C		C	C
Approach Delay (s)		12.7			12.5			20.9			23.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			13.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			49.8			Sum of lost time (s)			23.6			
Intersection Capacity Utilization			47.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: California Ave & Owens Street




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	278	71	12	515	0	67	26	2	3	41	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frt	1.00	0.97		1.00	1.00			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			1.00	1.00
Satd. Flow (prot)	1770	4930		1770	5085			1794			1857	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97			1.00	1.00
Satd. Flow (perm)	1770	4930		1770	5085			1794			1857	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	302	77	13	560	0	73	28	2	3	45	62
RTOR Reduction (vph)	0	44	0	0	0	0	0	1	0	0	0	57
Lane Group Flow (vph)	22	335	0	13	560	0	0	102	0	0	48	5
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												4
Actuated Green, G (s)	0.7	13.4		0.7	13.4			3.3			2.9	2.9
Effective Green, g (s)	0.7	13.4		0.7	13.4			3.3			2.9	2.9
Actuated g/C Ratio	0.02	0.36		0.02	0.36			0.09			0.08	0.08
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Vehicle Extension (s)	1.5	2.0		1.0	2.0			1.0			1.5	1.5
Lane Grp Cap (vph)	33	1771		33	1827			159			144	123
v/s Ratio Prot	c0.01	0.07		0.01	c0.11			c0.06			c0.03	
v/s Ratio Perm												0.00
v/c Ratio	0.67	0.19		0.39	0.31			0.64			0.33	0.04
Uniform Delay, d1	18.2	8.2		18.1	8.6			16.4			16.3	15.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	32.9	0.0		2.8	0.0			6.5			0.5	0.0
Delay (s)	51.1	8.2		20.9	8.6			22.9			16.8	16.0
Level of Service	D	A		C	A			C			B	B
Approach Delay (s)		10.6			8.9			22.9			16.3	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM Average Control Delay		11.4				HCM Level of Service				B		
HCM Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		37.3				Sum of lost time (s)		17.0				
Intersection Capacity Utilization		36.0%				ICU Level of Service		A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: California Ave & Owens Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	671	140	25	412	9	95	29	30	6	28	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Fr't	1.00	0.97		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	1.00
Satd. Flow (prot)	1770	4954		1770	5069			1759			1845	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.99	1.00
Satd. Flow (perm)	1770	4954		1770	5069			1759			1845	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	729	152	27	448	10	103	32	33	7	30	64
RTOR Reduction (vph)	0	33	0	0	3	0	0	10	0	0	0	60
Lane Group Flow (vph)	65	848	0	27	455	0	0	158	0	0	37	4
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												4
Actuated Green, G (s)	3.3	15.9		0.9	13.5			8.6			3.0	3.0
Effective Green, g (s)	3.3	15.9		0.9	13.5			8.6			3.0	3.0
Actuated g/C Ratio	0.07	0.35		0.02	0.30			0.19			0.07	0.07
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0			4.0	4.0
Vehicle Extension (s)	1.5	2.0		1.0	2.0			1.0			1.5	1.5
Lane Grp Cap (vph)	129	1735		35	1507			333			122	105
v/s Ratio Prot	c0.04	c0.17		0.02	0.09			c0.09			c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.50	0.49		0.77	0.30			0.48			0.30	0.04
Uniform Delay, d1	20.3	11.6		22.1	12.3			16.4			20.2	19.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.1	0.1		62.6	0.0			0.4			0.5	0.1
Delay (s)	21.4	11.6		84.7	12.4			16.8			20.7	19.9
Level of Service	C	B		F	B			B			C	B
Approach Delay (s)		12.3			16.4			16.8			20.2	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay		14.4				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		45.4				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		47.2%				ICU Level of Service		A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: California Ave & Haley Street























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	252	61	60	378	43	67	246	78	38	183	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Flt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4937		1770	5007		1770	1863	1583	1770	1804	
Flt Permitted	0.95	1.00		0.95	1.00		0.60	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	1770	4937		1770	5007		1123	1863	1583	1101	1804	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	274	66	65	411	47	73	267	85	41	199	53
RTOR Reduction (vph)	0	46	0	0	18	0	0	0	61	0	17	0
Lane Group Flow (vph)	38	294	0	65	440	0	73	267	24	41	235	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4		8	
Actuated Green, G (s)	0.9	11.1		2.1	12.3		10.3	10.3	10.3	10.3	10.3	
Effective Green, g (s)	0.9	11.1		2.1	12.3		10.3	10.3	10.3	10.3	10.3	
Actuated g/C Ratio	0.02	0.30		0.06	0.33		0.28	0.28	0.28	0.28	0.28	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	43	1477		100	1660		312	517	439	306	501	
v/s Ratio Prot	0.02	0.06		c0.04	c0.09			c0.14			0.13	
v/s Ratio Perm							0.07		0.01	0.04		
v/c Ratio	0.88	0.20		0.65	0.27		0.23	0.52	0.05	0.13	0.47	
Uniform Delay, d1	18.0	9.7		17.1	9.1		10.4	11.3	9.8	10.1	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	91.0	0.0		10.9	0.0		0.1	0.4	0.0	0.1	0.3	
Delay (s)	109.1	9.7		28.1	9.1		10.5	11.7	9.8	10.1	11.4	
Level of Service	F	A		C	A		B	B	A	B	B	
Approach Delay (s)		19.7			11.5			11.1			11.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay		13.2					HCM Level of Service		B			
HCM Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		37.1					Sum of lost time (s)		8.6			
Intersection Capacity Utilization		46.4%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

26: California Ave & Haley Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	551	57	56	414	54	70	333	99	47	300	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5014		1770	4997		1770	1863	1583	1770	1822	
Flt Permitted	0.95	1.00		0.95	1.00		0.41	1.00	1.00	0.43	1.00	
Satd. Flow (perm)	1770	5014		1770	4997		757	1863	1583	807	1822	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	599	62	61	450	59	76	362	108	51	326	55
RTOR Reduction (vph)	0	17	0	0	23	0	0	0	74	0	10	0
Lane Group Flow (vph)	64	644	0	61	486	0	76	362	34	51	371	0
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5	2		1	6			4				8
Permitted Phases							4		4		8	
Actuated Green, G (s)	3.1	12.5		3.1	12.5		13.4	13.4	13.4	13.4	13.4	
Effective Green, g (s)	3.1	12.5		3.1	12.5		13.4	13.4	13.4	13.4	13.4	
Actuated g/C Ratio	0.07	0.29		0.07	0.29		0.31	0.31	0.31	0.31	0.31	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.6	4.6	4.6	4.6	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	129	1471		129	1466		238	586	498	254	573	
v/s Ratio Prot	c0.04	c0.13		0.03	0.10			0.19			c0.20	
v/s Ratio Perm							0.10		0.02	0.06		
v/c Ratio	0.50	0.44		0.47	0.33		0.32	0.62	0.07	0.20	0.65	
Uniform Delay, d1	19.0	12.2		19.0	11.8		11.1	12.4	10.2	10.7	12.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.1		1.0	0.0		0.3	1.4	0.0	0.1	1.9	
Delay (s)	20.1	12.3		20.0	11.8		11.4	13.8	10.2	10.8	14.5	
Level of Service	C	B		B	B		B	B	B	B	B	
Approach Delay (s)		13.0			12.7			12.8			14.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.1			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			42.6			Sum of lost time (s)			13.6			
Intersection Capacity Utilization			56.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis





















27: California Ave & MT Vernon Ave

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	67	52	57	123	151	86	705	29	96	645	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	16	12	12
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.93		1.00	0.92		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3306		3433	3247		3433	3518		3891	3384	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3306		3433	3247		3433	3518		3891	3384	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	73	57	62	134	164	93	766	32	104	701	290
RTOR Reduction (vph)	0	44	0	0	135	0	0	3	0	0	47	0
Lane Group Flow (vph)	188	86	0	62	163	0	93	795	0	104	944	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.4	16.2		3.5	12.3		5.0	24.4		5.0	24.4	
Effective Green, g (s)	7.4	16.2		3.5	12.3		5.0	24.4		5.0	24.4	
Actuated g/C Ratio	0.11	0.23		0.05	0.18		0.07	0.35		0.07	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	366	772		173	575		247	1237		280	1190	
v/s Ratio Prot	c0.05	c0.03		0.02	c0.05		c0.03	0.23		0.03	c0.28	
v/s Ratio Perm												
v/c Ratio	0.51	0.11		0.36	0.28		0.38	0.64		0.37	0.79	
Uniform Delay, d1	29.3	20.9		31.9	24.7		30.7	18.8		30.7	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0		0.5	0.1		0.4	0.9		0.3	3.5	
Delay (s)	29.8	21.0		32.3	24.8		31.1	19.7		31.0	23.7	
Level of Service	C	C		C	C		C	B		C	C	
Approach Delay (s)		26.2			26.1			20.9			24.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		23.7										
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		69.4										
Intersection Capacity Utilization		60.0%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 27: California Ave & MT Vernon Ave













10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	347	207	123	67	78	132	127	868	57	219	803	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	16	12	12
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.94		1.00	0.91		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3341		3433	3206		3433	3506		3891	3382	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3341		3433	3206		3433	3506		3891	3382	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	225	134	73	85	143	138	943	62	238	873	366
RTOR Reduction (vph)	0	99	0	0	124	0	0	4	0	0	42	0
Lane Group Flow (vph)	377	260	0	73	104	0	138	1001	0	238	1197	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	16.7		5.3	11.0		7.2	34.1		7.8	34.7	
Effective Green, g (s)	11.0	16.7		5.3	11.0		7.2	34.1		7.8	34.7	
Actuated g/C Ratio	0.13	0.20		0.06	0.13		0.09	0.40		0.09	0.41	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	448	663		216	419		294	1420		360	1394	
v/s Ratio Prot	c0.11	c0.08		0.02	0.03		0.04	0.29		c0.06	c0.35	
v/s Ratio Perm												
v/c Ratio	0.84	0.39		0.34	0.25		0.47	0.70		0.66	0.86	
Uniform Delay, d1	35.7	29.3		37.8	32.9		36.7	20.9		36.9	22.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.9	0.1		0.3	0.1		0.4	1.3		3.5	5.3	
Delay (s)	48.6	29.5		38.1	33.0		37.1	22.2		40.4	27.8	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		39.3			34.2			24.0			29.8	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			30.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			84.2			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			71.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: 14TH Street & Q Street













10/12/2010

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	2	1	2	525	185	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	1	2	571	201	22
RTOR Reduction (vph)	0	1	0	0	0	12
Lane Group Flow (vph)	2	0	2	571	201	10
Turn Type	Perm		Prot		Perm	
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	0.5	0.5	0.5	15.4	10.9	10.9
Effective Green, g (s)	0.5	0.5	0.5	15.4	10.9	10.9
Actuated g/C Ratio	0.02	0.02	0.02	0.63	0.44	0.44
Clearance Time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	36	32	36	2225	1574	704
v/s Ratio Prot	c0.00		0.00	c0.16	0.06	
v/s Ratio Perm		0.00				0.01
v/c Ratio	0.06	0.00	0.06	0.26	0.13	0.01
Uniform Delay, d1	11.8	11.8	11.8	2.0	4.0	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.2	0.0	0.0	0.0
Delay (s)	12.0	11.8	12.0	2.0	4.0	3.8
Level of Service	B	B	B	A	A	A
Approach Delay (s)	11.9			2.1	4.0	
Approach LOS	B			A	A	
Intersection Summary						
HCM Average Control Delay	2.6			HCM Level of Service		A
HCM Volume to Capacity ratio	0.25					
Actuated Cycle Length (s)	24.5			Sum of lost time (s)		8.6
Intersection Capacity Utilization	25.0%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

28: 14TH Street & Q Street























10/12/2010

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	33	9	18	455	637	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	10	20	495	692	26
RTOR Reduction (vph)	0	10	0	0	0	10
Lane Group Flow (vph)	36	0	20	495	692	16
Turn Type	Perm		Prot	Perm		
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	0.6	0.6	0.5	17.2	12.7	12.7
Effective Green, g (s)	0.6	0.6	0.5	17.2	12.7	12.7
Actuated g/C Ratio	0.02	0.02	0.02	0.65	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.6	4.6	4.6
Vehicle Extension (s)	1.0	1.0	1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	40	36	34	2306	1702	762
v/s Ratio Prot	c0.02		0.01	c0.14	c0.20	
v/s Ratio Perm		0.00				0.01
v/c Ratio	0.90	0.01	0.59	0.21	0.41	0.02
Uniform Delay, d1	12.9	12.6	12.8	1.9	4.4	3.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	101.8	0.0	15.6	0.0	0.1	0.0
Delay (s)	114.7	12.6	28.5	1.9	4.5	3.6
Level of Service	F	B	C	A	A	A
Approach Delay (s)	92.5			2.9	4.4	
Approach LOS	F			A	A	
Intersection Summary						
HCM Average Control Delay	7.0		HCM Level of Service		A	
HCM Volume to Capacity ratio	0.46					
Actuated Cycle Length (s)	26.4		Sum of lost time (s)		13.2	
Intersection Capacity Utilization	28.1%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

29: Hayden Ct & Union Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	2	141	0	53	11	1883	104	284	1628	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt		0.85		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00		0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1794		1681	1905	1583	1770	5045		1770	5085	1583
Flt Permitted		1.00		0.95	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1794		1681	1905	1583	1770	5045		1770	5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2	153	0	58	12	2047	113	309	1770	5
RTOR Reduction (vph)	0	2	0	0	0	51	0	4	0	0	0	1
Lane Group Flow (vph)	0	0	0	76	77	7	12	2156	0	309	1770	4
Turn Type	Split			Split		Perm	Prot			Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)		1.4		12.7	12.7	12.7	1.2	59.5		22.4	80.7	80.7
Effective Green, g (s)		1.4		12.7	12.7	12.7	1.2	59.5		22.4	80.7	80.7
Actuated g/C Ratio		0.01		0.11	0.11	0.11	0.01	0.53		0.20	0.72	0.72
Clearance Time (s)		3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)		5.5		5.5	5.5	5.5	2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)		22		190	215	179	19	2668		352	3648	1136
v/s Ratio Prot		c0.00		c0.05	0.04		0.01	c0.43		c0.17	0.35	
v/s Ratio Perm						0.00						0.00
v/c Ratio		0.00		0.40	0.36	0.04	0.63	0.81		0.88	0.49	0.00
Uniform Delay, d1		54.9		46.4	46.1	44.5	55.4	21.8		43.7	6.9	4.5
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.1		3.4	2.5	0.2	40.9	2.2		20.5	0.2	0.0
Delay (s)		54.9		49.7	48.6	44.7	96.3	24.0		64.2	7.1	4.5
Level of Service		D		D	D	D	F	C		E	A	A
Approach Delay (s)		54.9			47.9			24.4			15.6	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM Average Control Delay			21.4									
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			112.5									
Intersection Capacity Utilization			75.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Hayden Ct & Union Ave

























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	7	29	225	11	241	52	2072	10	93	2293	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1858		1681	1918	1583	1770	5082		1770	5085	1583
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1858		1681	1918	1583	1770	5082		1770	5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	8	32	245	12	262	57	2252	11	101	2492	52
RTOR Reduction (vph)	0	30	0	0	0	222	0	0	0	0	0	7
Lane Group Flow (vph)	42	10	0	127	130	40	57	2263	0	101	2492	45
Turn Type	Split			Split		Perm	Prot			Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	8.7	8.7		17.0	17.0	17.0	6.0	61.7		8.2	63.9	63.9
Effective Green, g (s)	8.7	8.7		17.0	17.0	17.0	6.0	61.7		8.2	63.9	63.9
Actuated g/C Ratio	0.08	0.08		0.15	0.15	0.15	0.05	0.55		0.07	0.57	0.57
Clearance Time (s)	3.7	3.7		4.2	4.2	4.2	3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	5.5	5.5		5.5	5.5	5.5	2.0	5.2		2.0	5.2	5.2
Lane Grp Cap (vph)	137	144		255	291	240	95	2797		129	2899	902
v/s Ratio Prot	c0.02	0.01		c0.08	0.07		0.03	0.45		c0.06	c0.49	
v/s Ratio Perm						0.03						0.03
v/c Ratio	0.31	0.07		0.50	0.45	0.17	0.60	0.81		0.78	0.86	0.05
Uniform Delay, d1	48.8	48.0		43.6	43.3	41.4	51.9	20.4		51.1	20.3	10.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	0.5		3.7	2.7	0.8	7.1	2.1		24.2	3.1	0.1
Delay (s)	52.0	48.5		47.4	45.9	42.2	59.0	22.5		75.3	23.4	10.7
Level of Service	D	D		D	D	D	E	C		E	C	B
Approach Delay (s)		50.3			44.4			23.4			25.1	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM Average Control Delay		26.6										
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		112.1										
Intersection Capacity Utilization		73.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: Truxtun Ave & Oak St

























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1343	1023	135	133	526	53	401	624	420	96	263	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1460	1112	147	145	572	58	436	678	457	104	286	450
RTOR Reduction (vph)	0	0	55	0	0	48	0	0	145	0	0	385
Lane Group Flow (vph)	1460	1112	92	145	572	10	436	678	312	104	286	65
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	62.2	57.1	57.1	30.2	25.1	25.1	19.0	32.9	32.9	7.1	21.0	21.0
Effective Green, g (s)	62.2	57.1	57.1	30.2	25.1	25.1	19.0	32.9	32.9	7.1	21.0	21.0
Actuated g/C Ratio	0.43	0.39	0.39	0.21	0.17	0.17	0.13	0.23	0.23	0.05	0.14	0.14
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Vehicle Extension (s)	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Lane Grp Cap (vph)	1468	1389	621	713	611	273	448	800	358	168	511	228
v/s Ratio Prot	c0.43	0.31		0.04	c0.16		c0.13	0.19		0.03	c0.08	
v/s Ratio Perm			0.06			0.01			c0.20			0.04
v/c Ratio	0.99	0.80	0.15	0.20	0.94	0.04	0.97	0.85	0.87	0.62	0.56	0.28
Uniform Delay, d1	41.5	39.2	28.5	47.7	59.4	50.1	63.0	53.9	54.2	67.9	57.9	55.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.0	3.2	0.0	0.1	21.6	0.0	35.2	8.0	19.4	4.7	0.8	0.3
Delay (s)	63.5	42.4	28.5	47.7	81.0	50.2	98.2	61.9	73.6	72.6	58.7	55.8
Level of Service	E	D	C	D	F	D	F	E	E	E	E	E
Approach Delay (s)		53.0			72.5			75.4			58.9	
Approach LOS		D			E			E			E	
Intersection Summary												
HCM Average Control Delay			62.3				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			145.5				Sum of lost time (s)			12.9		
Intersection Capacity Utilization			90.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: Truxtun Ave & Oak St






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1001	1359	335	447	1202	77	283	603	299	108	822	949
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1088	1477	364	486	1307	84	308	655	325	117	893	1032
RTOR Reduction (vph)	0	0	83	0	0	34	0	0	171	0	0	236
Lane Group Flow (vph)	1088	1477	281	486	1307	50	308	655	154	117	893	796
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	30.0	60.1	60.1	15.0	45.1	45.1	11.0	34.7	34.7	22.0	45.7	45.7
Effective Green, g (s)	30.0	60.1	60.1	15.0	45.1	45.1	11.0	34.7	34.7	22.0	45.7	45.7
Actuated g/C Ratio	0.20	0.40	0.40	0.10	0.30	0.30	0.07	0.23	0.23	0.15	0.30	0.30
Clearance Time (s)	4.0	4.9	4.9	4.0	4.9	4.9	4.0	5.3	5.3	4.0	5.3	5.3
Vehicle Extension (s)	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0
Lane Grp Cap (vph)	687	1418	634	343	1064	476	252	819	366	504	1078	482
v/s Ratio Prot	c0.32	0.42		0.14	c0.37		c0.09	0.19		0.03	0.25	
v/s Ratio Perm			0.18			0.03			0.10			c0.50
v/c Ratio	1.58	1.04	0.44	1.42	1.23	0.10	1.22	0.80	0.42	0.23	0.83	1.65
Uniform Delay, d1	60.0	44.9	32.7	67.5	52.4	37.9	69.5	54.4	49.1	56.5	48.5	52.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	269.6	35.5	0.2	204.0	111.2	0.0	130.2	5.1	0.3	0.1	5.1	302.6
Delay (s)	329.6	80.4	32.9	271.5	163.6	37.9	199.7	59.5	49.4	56.6	53.6	354.7
Level of Service	F	F	C	F	F	D	F	E	D	E	D	F
Approach Delay (s)		167.1			185.9			90.5			206.0	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		169.1										
HCM Volume to Capacity ratio		1.46										
Actuated Cycle Length (s)		150.0										
Intersection Capacity Utilization		111.9%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: Truxtun St & F Street






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1195	7	13	769	47	16	34	1	83	77	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3536		1770	3509		1770	1855		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3536		1770	3509		1770	1855		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	1299	8	14	836	51	17	37	1	90	84	71
RTOR Reduction (vph)	0	0	0	0	5	0	0	1	0	0	0	62
Lane Group Flow (vph)	103	1307	0	14	882	0	17	37	0	90	84	9
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	5.1	30.7		0.7	26.3		0.8	4.1		3.9	7.2	7.2
Effective Green, g (s)	5.1	30.7		0.7	26.3		0.8	4.1		3.9	7.2	7.2
Actuated g/C Ratio	0.09	0.55		0.01	0.47		0.01	0.07		0.07	0.13	0.13
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	162	1952		22	1660		25	137		124	241	205
v/s Ratio Prot	c0.06	c0.37		0.01	0.25		0.01	0.02		c0.05	c0.05	
v/s Ratio Perm												0.01
v/c Ratio	0.64	0.67		0.64	0.53		0.68	0.27		0.73	0.35	0.04
Uniform Delay, d1	24.4	8.8		27.3	10.3		27.3	24.3		25.3	22.1	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.9	0.7		36.7	0.2		46.7	0.4		16.3	0.3	0.0
Delay (s)	30.2	9.5		64.0	10.5		74.0	24.7		41.6	22.4	21.2
Level of Service	C	A		E	B		E	C		D	C	C
Approach Delay (s)		11.0			11.3			39.9			29.1	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM Average Control Delay		13.4					HCM Level of Service			B		
HCM Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		55.6					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		58.0%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: Truxtun St & F Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	1798	18	37	1467	62	79	94	10	182	64	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3534		1770	3518		1770	1836		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3534		1770	3518		1770	1836		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	1954	20	40	1595	67	86	102	11	198	70	107
RTOR Reduction (vph)	0	0	0	0	2	0	0	3	0	0	0	90
Lane Group Flow (vph)	105	1974	0	40	1660	0	86	110	0	198	70	17
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	9.5	71.8		5.1	67.4		7.7	12.6		14.1	19.0	19.0
Effective Green, g (s)	9.5	71.8		5.1	67.4		7.7	12.6		14.1	19.0	19.0
Actuated g/C Ratio	0.08	0.60		0.04	0.56		0.06	0.11		0.12	0.16	0.16
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	140	2118		75	1979		114	193		208	295	251
v/s Ratio Prot	c0.06	c0.56		0.02	0.47		0.05	c0.06		c0.11	0.04	
v/s Ratio Perm												0.01
v/c Ratio	0.75	0.93		0.53	0.84		0.75	0.57		0.95	0.24	0.07
Uniform Delay, d1	54.0	21.8		56.2	21.7		55.1	51.0		52.5	44.1	42.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.0	8.0		3.6	3.1		21.9	2.5		48.3	0.2	0.0
Delay (s)	71.9	29.8		59.8	24.8		77.0	53.6		100.8	44.2	42.9
Level of Service	E	C		E	C		E	D		F	D	D
Approach Delay (s)		31.9			25.7			63.7			73.7	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM Average Control Delay		34.5					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		119.8					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		80.5%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: Truxtun St & H St





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1089	103	73	658	22	111	414	94	20	258	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3493		1770	3522		1770	3441		1770	3462	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3493		1770	3522		1770	3441		1770	3462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	1184	112	79	715	24	121	450	102	22	280	48
RTOR Reduction (vph)	0	7	0	0	2	0	0	21	0	0	16	0
Lane Group Flow (vph)	103	1289	0	79	737	0	121	531	0	22	312	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.2	32.2		5.1	31.1		7.5	20.5		2.6	15.6	
Effective Green, g (s)	6.2	32.2		5.1	31.1		7.5	20.5		2.6	15.6	
Actuated g/C Ratio	0.08	0.43		0.07	0.42		0.10	0.27		0.03	0.21	
Clearance Time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Vehicle Extension (s)	0.5	2.0		0.5	2.0		0.5	2.0		0.5	2.0	
Lane Grp Cap (vph)	147	1506		121	1466		178	944		62	723	
v/s Ratio Prot	c0.06	c0.37		0.04	0.21		c0.07	c0.15		0.01	0.09	
v/s Ratio Perm												
v/c Ratio	0.70	0.86		0.65	0.50		0.68	0.56		0.35	0.43	
Uniform Delay, d1	33.3	19.2		33.9	16.1		32.4	23.3		35.2	25.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.6	4.8		9.2	0.1		7.9	0.5		1.3	0.2	
Delay (s)	45.0	24.0		43.2	16.2		40.3	23.7		36.5	25.8	
Level of Service	D	C		D	B		D	C		D	C	
Approach Delay (s)		25.5			18.8			26.7			26.5	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM Average Control Delay		24.2					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		74.7					Sum of lost time (s)		6.4			
Intersection Capacity Utilization		72.2%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

32: Truxtun St & H St






























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	1666	91	56	1230	15	186	322	9	33	656	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Flt	1.00	0.99		1.00	1.00		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3512		1770	3533		1770	3524		1770	3484	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3512		1770	3533		1770	3524		1770	3484	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	1811	99	61	1337	16	202	350	10	36	713	82
RTOR Reduction (vph)	0	3	0	0	1	0	0	1	0	0	7	0
Lane Group Flow (vph)	147	1907	0	61	1352	0	202	359	0	36	788	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.2	66.0		6.0	59.8		13.8	37.6		4.8	28.6	
Effective Green, g (s)	12.2	66.0		6.0	59.8		13.8	37.6		4.8	28.6	
Actuated g/C Ratio	0.09	0.51		0.05	0.46		0.11	0.29		0.04	0.22	
Clearance Time (s)	3.2	3.5		3.2	3.5		3.2	4.4		3.2	4.4	
Vehicle Extension (s)	0.5	2.0		0.5	2.0		0.5	2.0		0.5	2.0	
Lane Grp Cap (vph)	168	1801		83	1642		190	1030		66	774	
v/s Ratio Prot	c0.08	c0.54		0.03	0.38		c0.11	0.10		0.02	c0.23	
v/s Ratio Perm												
v/c Ratio	0.88	1.06		0.73	0.82		1.06	0.35		0.55	1.02	
Uniform Delay, d1	57.5	31.3		60.6	29.9		57.4	35.9		60.9	50.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	35.3	38.8		24.9	3.3		83.0	0.1		4.9	37.0	
Delay (s)	92.8	70.1		85.4	33.2		140.5	36.0		65.7	87.0	
Level of Service	F	E		F	C		F	D		E	F	
Approach Delay (s)		71.8			35.5			73.5			86.1	
Approach LOS		E			D			E			F	
Intersection Summary												
HCM Average Control Delay		63.9					HCM Level of Service		E			
HCM Volume to Capacity ratio		1.02										
Actuated Cycle Length (s)		128.7					Sum of lost time (s)		10.8			
Intersection Capacity Utilization		96.8%					ICU Level of Service		F			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Truxtun St & Chester Ave






























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Volume (vph)	115	783	60	152	592	68	106	570	262	126	304	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	851	65	165	643	74	115	620	285	137	330	146
RTOR Reduction (vph)	0	0	36	0	0	52	0	0	208	0	0	115
Lane Group Flow (vph)	125	851	29	165	643	22	115	620	77	137	330	31
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.8	18.0	18.0	7.9	20.1	20.1	10.4	17.1	17.1	7.3	14.0	14.0
Effective Green, g (s)	5.8	18.0	18.0	7.9	20.1	20.1	10.4	17.1	17.1	7.3	14.0	14.0
Actuated g/C Ratio	0.09	0.27	0.27	0.12	0.30	0.30	0.16	0.26	0.26	0.11	0.21	0.21
Clearance Time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	155	1383	430	211	1075	481	278	914	409	195	748	335
v/s Ratio Prot	0.07	0.17		c0.09	c0.18		0.06	c0.18		c0.08	0.09	
v/s Ratio Perm			0.02			0.01			0.05			0.02
v/c Ratio	0.81	0.62	0.07	0.78	0.60	0.05	0.41	0.68	0.19	0.70	0.44	0.09
Uniform Delay, d1	29.6	21.1	17.9	28.3	19.6	16.3	25.2	22.1	19.1	28.4	22.7	21.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.2	0.6	0.0	15.8	0.6	0.0	0.4	1.6	0.1	9.0	0.2	0.0
Delay (s)	53.9	21.6	17.9	44.1	20.2	16.3	25.5	23.7	19.2	37.4	22.8	21.0
Level of Service	D	C	B	D	C	B	C	C	B	D	C	C
Approach Delay (s)		25.3			24.4			22.6			25.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			24.4				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			66.2				Sum of lost time (s)			11.5		
Intersection Capacity Utilization			60.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

33: Truxtun St & Chester Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Volume (vph)	247	1341	116	189	902	112	71	470	101	131	738	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	268	1458	126	205	980	122	77	511	110	142	802	304
RTOR Reduction (vph)	0	0	32	0	0	84	0	0	85	0	0	108
Lane Group Flow (vph)	268	1458	94	205	980	38	77	511	25	142	802	196
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.3	29.6	29.6	11.4	26.7	26.7	5.7	19.2	19.2	8.9	22.4	22.4
Effective Green, g (s)	14.3	29.6	29.6	11.4	26.7	26.7	5.7	19.2	19.2	8.9	22.4	22.4
Actuated g/C Ratio	0.17	0.35	0.35	0.13	0.31	0.31	0.07	0.23	0.23	0.10	0.26	0.26
Clearance Time (s)	4.0	4.4	4.4	4.0	4.4	4.4	4.0	3.5	3.5	4.0	3.5	3.5
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	298	1771	551	237	1112	497	119	799	358	185	933	417
v/s Ratio Prot	c0.15	c0.29		0.12	0.28		0.04	c0.14		0.08	c0.23	
v/s Ratio Perm			0.06			0.02			0.02			0.12
v/c Ratio	0.90	0.82	0.17	0.86	0.88	0.08	0.65	0.64	0.07	0.77	0.86	0.47
Uniform Delay, d1	34.6	25.3	19.2	36.0	27.6	20.5	38.7	29.8	25.9	37.0	29.8	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.1	3.1	0.1	25.6	8.2	0.0	8.7	1.2	0.0	15.7	7.7	0.3
Delay (s)	61.7	28.4	19.2	61.7	35.8	20.5	47.4	31.0	25.9	52.7	37.5	26.6
Level of Service	E	C	B	E	D	C	D	C	C	D	D	C
Approach Delay (s)		32.6			38.4			32.0			36.6	
Approach LOS		C			D			C			D	
Intersection Summary												
HCM Average Control Delay			35.0				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)			11.9		
Intersection Capacity Utilization			76.6%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Truxtun St & L Street

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	540	442	317	542	26	42	41	72	34	384	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4742		1770	5051		1770	1863	1583	1770	1837	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4742		1770	5051		1770	1863	1583	1770	1837	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	587	480	345	589	28	46	45	78	37	417	43
RTOR Reduction (vph)	0	163	0	0	7	0	0	0	56	0	4	0
Lane Group Flow (vph)	208	904	0	345	610	0	46	45	22	37	456	0
Turn Type	Prot			Prot			Prot			Perm	Prot	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	22.4	19.4		17.9	14.9		3.6	22.7	22.7	3.4	22.5	
Effective Green, g (s)	22.4	19.4		17.9	14.9		3.6	22.7	22.7	3.4	22.5	
Actuated g/C Ratio	0.28	0.24		0.22	0.19		0.04	0.28	0.28	0.04	0.28	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	496	1150		396	941		80	529	449	75	517	
v/s Ratio Prot	0.12	c0.19		c0.19	0.12		c0.03	0.02		0.02	c0.25	
v/s Ratio Perm									0.01			
v/c Ratio	0.42	0.87dr		0.87	0.65		0.57	0.09	0.05	0.49	0.88	
Uniform Delay, d1	23.5	28.4		29.9	30.1		37.5	21.0	20.8	37.5	27.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	3.3		18.0	1.2		6.1	0.0	0.0	1.9	15.7	
Delay (s)	23.7	31.7		47.9	31.3		43.5	21.1	20.8	39.3	43.2	
Level of Service	C	C		D	C		D	C	C	D	D	
Approach Delay (s)		30.4			37.3			27.1			42.9	
Approach LOS		C			D			C			D	

Intersection Summary

HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		























dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

34: Truxtun St & L Street




























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	204	1315	48	67	927	84	174	321	183	171	138	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5059		1770	5022		1770	1863	1583	1770	1694	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5059		1770	5022		1770	1863	1583	1770	1694	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	1429	52	73	1008	91	189	349	199	186	150	230
RTOR Reduction (vph)	0	4	0	0	12	0	0	0	154	0	65	0
Lane Group Flow (vph)	222	1477	0	73	1087	0	189	349	45	186	315	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.2	30.6		5.3	22.7		10.8	18.6	18.6	10.4	18.2	
Effective Green, g (s)	13.2	30.6		5.3	22.7		10.8	18.6	18.6	10.4	18.2	
Actuated g/C Ratio	0.16	0.38		0.07	0.28		0.13	0.23	0.23	0.13	0.22	
Clearance Time (s)	4.0	4.6		4.0	4.6		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	287	1899		115	1399		235	425	361	226	378	
v/s Ratio Prot	0.13	c0.29		0.04	c0.22		0.11	c0.19		0.11	c0.19	
v/s Ratio Perm									0.03			
v/c Ratio	0.77	0.78		0.63	0.78		0.80	0.82	0.13	0.82	0.83	
Uniform Delay, d1	32.7	22.5		37.2	27.1		34.3	29.9	25.0	34.7	30.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.2	1.9		8.1	2.5		16.9	11.5	0.1	20.0	13.9	
Delay (s)	43.9	24.3		45.3	29.6		51.2	41.4	25.0	54.7	44.1	
Level of Service	D	C		D	C		D	D	C	D	D	
Approach Delay (s)		26.9			30.6			39.5			47.6	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay		33.0					HCM Level of Service		C			
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		81.5					Sum of lost time (s)		8.6			
Intersection Capacity Utilization		74.8%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Truxtun St & N Street
























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Volume (vph)	123	476	66	77	814	19	23	62	56	43	52	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5068		1770	1863	1583	1770	1785	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5068		1770	1863	1583	1770	1785	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	517	72	84	885	21	25	67	61	47	57	22
RTOR Reduction (vph)	0	0	47	0	3	0	0	0	54	0	19	0
Lane Group Flow (vph)	134	517	25	84	903	0	25	67	7	47	60	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	5.3	16.4	16.4	6.2	17.3		0.8	5.0	5.0	1.8	6.0	
Effective Green, g (s)	5.3	16.4	16.4	6.2	17.3		0.8	5.0	5.0	1.8	6.0	
Actuated g/C Ratio	0.11	0.35	0.35	0.13	0.37		0.02	0.11	0.11	0.04	0.13	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	202	1793	558	236	1886		30	200	170	69	230	
v/s Ratio Prot	c0.08	0.10		0.05	c0.18		0.01	c0.04		c0.03	0.03	
v/s Ratio Perm			0.02						0.00			
v/c Ratio	0.66	0.29	0.05	0.36	0.48		0.83	0.34	0.04	0.68	0.26	
Uniform Delay, d1	19.7	10.8	9.9	18.3	11.2		22.8	19.2	18.6	22.1	18.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.2	0.0	0.0	0.3	0.1		93.0	0.4	0.0	19.8	0.2	
Delay (s)	26.0	10.9	9.9	18.7	11.2		115.7	19.6	18.6	41.9	18.5	
Level of Service	C	B	A	B	B		F	B	B	D	B	
Approach Delay (s)		13.6			11.9			34.9			27.2	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay		15.2				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		46.5				Sum of lost time (s)		17.1				
Intersection Capacity Utilization		42.9%				ICU Level of Service		A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Truxtun St & N Street























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	1460	45	25	961	23	46	37	84	39	20	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5067		1770	1863	1583	1770	1684	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5067		1770	1863	1583	1770	1684	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	1587	49	27	1045	25	50	40	91	42	22	39
RTOR Reduction (vph)	0	0	13	0	2	0	0	0	81	0	36	0
Lane Group Flow (vph)	104	1587	36	27	1068	0	50	40	10	42	25	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	5.1	27.8	27.8	1.2	23.9		3.0	5.8	5.8	1.9	4.7	
Effective Green, g (s)	5.1	27.8	27.8	1.2	23.9		3.0	5.8	5.8	1.9	4.7	
Actuated g/C Ratio	0.09	0.52	0.52	0.02	0.44		0.06	0.11	0.11	0.04	0.09	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.6		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.5	1.5	1.0	1.5	
Lane Grp Cap (vph)	168	2628	818	39	2251		99	201	171	63	147	
v/s Ratio Prot	0.06	c0.31		0.02	c0.21		c0.03	c0.02		0.02	0.02	
v/s Ratio Perm			0.02						0.01			
v/c Ratio	0.62	0.60	0.04	0.69	0.47		0.51	0.20	0.06	0.67	0.17	
Uniform Delay, d1	23.4	9.1	6.4	26.1	10.5		24.7	21.9	21.5	25.6	22.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.3	0.0	35.0	0.1		1.5	0.2	0.1	18.7	0.2	
Delay (s)	28.1	9.4	6.4	61.1	10.6		26.2	22.1	21.6	44.3	23.0	
Level of Service	C	A	A	E	B		C	C	C	D	C	
Approach Delay (s)		10.4			11.8			23.0			31.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			12.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			53.8			Sum of lost time (s)			8.6			
Intersection Capacity Utilization			51.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Truxtun St & Q Street























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	331	83	302	837	50	64	195	118	42	285	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4933		1770	5043		1770	1863	1583	1770	1827	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4933		1770	5043		1770	1863	1583	1770	1827	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	360	90	328	910	54	70	212	128	46	310	46
RTOR Reduction (vph)	0	52	0	0	7	0	0	0	94	0	7	0
Lane Group Flow (vph)	107	398	0	328	957	0	70	212	34	46	349	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	5.6	16.6		10.9	21.9		3.7	17.7	17.7	3.3	17.3	
Effective Green, g (s)	5.6	16.6		10.9	21.9		3.7	17.7	17.7	3.3	17.3	
Actuated g/C Ratio	0.08	0.25		0.17	0.33		0.06	0.27	0.27	0.05	0.26	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)	150	1241		292	1673		99	500	425	89	479	
v/s Ratio Prot	c0.06	0.08		c0.19	c0.19		c0.04	0.11		0.03	c0.19	
v/s Ratio Perm									0.02			
v/c Ratio	0.71	0.32		1.12	0.57		0.71	0.42	0.08	0.52	0.73	
Uniform Delay, d1	29.4	20.1		27.6	18.2		30.6	19.9	18.1	30.6	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.5	0.1		90.1	0.3		17.1	0.2	0.0	2.1	4.7	
Delay (s)	41.9	20.2		117.6	18.5		47.7	20.2	18.1	32.7	26.9	
Level of Service	D	C		F	B		D	C	B	C	C	
Approach Delay (s)		24.3			43.6			24.2			27.6	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		34.2					HCM Level of Service		C			
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		66.0					Sum of lost time (s)		16.6			
Intersection Capacity Utilization		60.7%					ICU Level of Service		B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Truxtun St & Q Street













10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	294	1101	75	127	570	105	57	551	235	118	342	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Flt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5036		1770	4967		1770	1863	1583	1770	1816	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5036		1770	4967		1770	1863	1583	1770	1816	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	320	1197	82	138	620	114	62	599	255	128	372	74
RTOR Reduction (vph)	0	8	0	0	30	0	0	0	170	0	7	0
Lane Group Flow (vph)	320	1271	0	138	704	0	62	599	85	128	439	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	18.9	28.1		9.0	18.2		5.5	31.0	31.0	7.8	33.3	
Effective Green, g (s)	18.9	28.1		9.0	18.2		5.5	31.0	31.0	7.8	33.3	
Actuated g/C Ratio	0.20	0.30		0.10	0.19		0.06	0.33	0.33	0.08	0.36	
Clearance Time (s)	4.0	4.9		4.0	4.9		4.0	4.6	4.6	4.0	4.6	
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)	358	1515		171	968		104	618	525	148	647	
v/s Ratio Prot	0.18	c0.25		0.08	c0.14		0.04	c0.32		c0.07	0.24	
v/s Ratio Perm									0.05			
v/c Ratio	0.89	0.84		0.81	0.73		0.60	0.97	0.16	0.86	0.68	
Uniform Delay, d1	36.3	30.5		41.3	35.3		42.9	30.7	22.0	42.3	25.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	22.9	4.1		22.4	2.3		6.0	28.1	0.1	36.4	2.2	
Delay (s)	59.2	34.6		63.7	37.6		48.9	58.8	22.1	78.7	27.7	
Level of Service	E	C		E	D		D	E	C	E	C	
Approach Delay (s)		39.5			41.7			47.9			39.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay		41.9		HCM Level of Service				D				
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		93.4		Sum of lost time (s)				18.4				
Intersection Capacity Utilization		80.1%		ICU Level of Service				D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: Truxtun Ave & E 19TH ST













10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑↑	↑	↑	↑↑		↑	↑↑	
Volume (vph)	0	273	123	283	775	76	178	69	0	21	60	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	5085	1583	1770	3539		1770	3481	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.71	1.00		0.71	1.00	
Satd. Flow (perm)		3539	1583	1770	5085	1583	1317	3539		1314	3481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	297	134	308	842	83	193	75	0	23	65	8
RTOR Reduction (vph)	0	0	102	0	0	36	0	0	0	0	6	0
Lane Group Flow (vph)	0	297	32	308	842	47	193	75	0	23	67	0
Turn Type			Prot	Prot		Perm	Perm			Perm		
Protected Phases		2	2	1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)		10.7	10.7	10.4	25.1	25.1	9.0	9.0		9.0	9.0	
Effective Green, g (s)		10.7	10.7	10.4	25.1	25.1	9.0	9.0		9.0	9.0	
Actuated g/C Ratio		0.24	0.24	0.23	0.57	0.57	0.20	0.20		0.20	0.20	
Clearance Time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		2.0	2.0	1.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		855	382	416	2881	897	268	719		267	707	
v/s Ratio Prot		0.08	0.02	c0.17	c0.17			0.02			0.02	
v/s Ratio Perm						0.03	c0.15			0.02		
v/c Ratio		0.35	0.08	0.74	0.29	0.05	0.72	0.10		0.09	0.09	
Uniform Delay, d1		13.9	13.0	15.7	5.0	4.3	16.5	14.4		14.3	14.3	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0	6.1	0.0	0.0	7.8	0.0		0.1	0.0	
Delay (s)		14.0	13.0	21.8	5.0	4.3	24.3	14.4		14.4	14.4	
Level of Service		B	B	C	A	A	C	B		B	B	
Approach Delay (s)		13.7			9.2			21.5			14.4	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM Average Control Delay			12.0			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			44.3			Sum of lost time (s)				9.3		
Intersection Capacity Utilization			52.4%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: Truxtun Ave & E 19TH ST




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑↑	↑	↑	↑↑		↑	↑↑	
Volume (vph)	0	694	355	200	448	46	82	70	0	39	133	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	5085	1583	1770	3539		1770	3539	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.66	1.00		0.70	1.00	
Satd. Flow (perm)		3539	1583	1770	5085	1583	1229	3539		1313	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	754	386	217	487	50	89	76	0	42	145	0
RTOR Reduction (vph)	0	0	247	0	0	17	0	0	0	0	0	0
Lane Group Flow (vph)	0	754	139	217	487	33	89	76	0	42	145	0
Turn Type			Prot	Prot		Perm	Perm			Perm		
Protected Phases		2	2	1	6			8				4
Permitted Phases						6	8			4		
Actuated Green, G (s)		17.3	17.3	10.0	31.3	31.3	6.5	6.5		6.5	6.5	
Effective Green, g (s)		17.3	17.3	10.0	31.3	31.3	6.5	6.5		6.5	6.5	
Actuated g/C Ratio		0.36	0.36	0.21	0.65	0.65	0.14	0.14		0.14	0.14	
Clearance Time (s)		4.9	4.9	4.0	4.9	4.9	5.3	5.3		5.3	5.3	
Vehicle Extension (s)		2.0	2.0	1.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1276	571	369	3316	1032	166	479		178	479	
v/s Ratio Prot		c0.21	0.09	c0.12	0.10			0.02			0.04	
v/s Ratio Perm						0.02	c0.07			0.03		
v/c Ratio		0.59	0.24	0.59	0.15	0.03	0.54	0.16		0.24	0.30	
Uniform Delay, d1		12.5	10.8	17.1	3.2	3.0	19.3	18.3		18.5	18.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.1	1.5	0.0	0.0	1.7	0.1		0.2	0.1	
Delay (s)		13.0	10.8	18.7	3.2	3.0	21.0	18.4		18.8	18.8	
Level of Service		B	B	B	A	A	C	B		B	B	
Approach Delay (s)		12.2			7.7			19.8			18.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay			11.8			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			48.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			54.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 19th ST & Q Street




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	50	15	17	64	14	9	234	21	26	408	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.97			0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1803			1810		1770	1840		1770	1863	1583
Flt Permitted		0.98			0.95		0.43	1.00		0.59	1.00	1.00
Satd. Flow (perm)		1777			1733		793	1840		1098	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	54	16	18	70	15	10	254	23	28	443	16
RTOR Reduction (vph)	0	11	0	0	10	0	0	6	0	0	0	10
Lane Group Flow (vph)	0	64	0	0	93	0	10	271	0	28	443	6
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)		11.5			11.5		13.6	13.6		13.6	13.6	13.6
Effective Green, g (s)		11.5			11.5		13.6	13.6		13.6	13.6	13.6
Actuated g/C Ratio		0.34			0.34		0.40	0.40		0.40	0.40	0.40
Clearance Time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)		5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		596			581		314	730		435	739	628
v/s Ratio Prot								0.15			c0.24	
v/s Ratio Perm		0.04			c0.05		0.01			0.03		0.00
v/c Ratio		0.11			0.16		0.03	0.37		0.06	0.60	0.01
Uniform Delay, d1		7.9			8.0		6.3	7.3		6.4	8.2	6.3
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.2			0.3		0.1	0.7		0.1	2.0	0.0
Delay (s)		8.0			8.3		6.4	8.0		6.5	10.2	6.3
Level of Service		A			A		A	A		A	B	A
Approach Delay (s)		8.0			8.3			7.9			9.8	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay		9.0					HCM Level of Service			A		
HCM Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		34.3					Sum of lost time (s)			9.2		
Intersection Capacity Utilization		54.0%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: 19th ST & Q Street




















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	137	49	39	143	63	20	968	58	30	510	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.97			0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1794			1784		1770	1847		1770	1863	1583
Flt Permitted		0.95			0.91		0.39	1.00		0.07	1.00	1.00
Satd. Flow (perm)		1719			1627		721	1847		134	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	149	53	42	155	68	22	1052	63	33	554	24
RTOR Reduction (vph)	0	13	0	0	14	0	0	2	0	0	0	8
Lane Group Flow (vph)	0	211	0	0	251	0	22	1113	0	33	554	16
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		6
Actuated Green, G (s)		20.3			20.3		55.6	55.6		55.6	55.6	55.6
Effective Green, g (s)		20.3			20.3		55.6	55.6		55.6	55.6	55.6
Actuated g/C Ratio		0.24			0.24		0.65	0.65		0.65	0.65	0.65
Clearance Time (s)		4.6			4.6		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)		5.0			5.0		5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		410			388		471	1207		88	1217	1034
v/s Ratio Prot								c0.60			0.30	
v/s Ratio Perm		0.12			c0.15		0.03			0.25		0.01
v/c Ratio		0.51			0.65		0.05	0.92		0.38	0.46	0.02
Uniform Delay, d1		28.1			29.2		5.3	12.9		6.8	7.3	5.2
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.2			5.0		0.1	12.0		5.5	0.6	0.0
Delay (s)		30.3			34.2		5.4	24.9		12.3	7.8	5.2
Level of Service		C			C		A	C		B	A	A
Approach Delay (s)		30.3			34.2			24.5			8.0	
Approach LOS		C			C			C			A	
Intersection Summary												
HCM Average Control Delay		21.7					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		85.1					Sum of lost time (s)			9.2		
Intersection Capacity Utilization		83.3%					ICU Level of Service			E		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

39: 21st St & F St




















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	183	22	11	96	21	6	233	14	39	453	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95			0.95	
Frt	1.00	1.00	0.85	1.00	0.97			0.99			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1812			3506			3460	
Flt Permitted	0.68	1.00	1.00	0.63	1.00			0.93			0.91	
Satd. Flow (perm)	1258	1863	1583	1179	1812			3279			3176	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	199	24	12	104	23	7	253	15	42	492	78
RTOR Reduction (vph)	0	0	14	0	14	0	0	11	0	0	31	0
Lane Group Flow (vph)	83	199	10	12	113	0	0	264	0	0	581	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			6	
Permitted Phases	4		4	4			2			6		
Actuated Green, G (s)	11.7	11.7	11.7	11.7	11.7			8.6			8.6	
Effective Green, g (s)	11.7	11.7	11.7	11.7	11.7			8.6			8.6	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40			0.30			0.30	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	509	754	641	477	734			976			945	
v/s Ratio Prot		c0.11			0.06							
v/s Ratio Perm	0.07		0.01	0.01				0.08			c0.18	
v/c Ratio	0.16	0.26	0.02	0.03	0.15			0.27			0.61	
Uniform Delay, d1	5.5	5.7	5.1	5.2	5.5			7.8			8.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.0	0.0			0.1			0.8	
Delay (s)	5.5	5.8	5.2	5.2	5.5			7.8			9.6	
Level of Service	A	A	A	A	A			A			A	
Approach Delay (s)		5.7			5.5			7.8			9.6	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay		7.9				HCM Level of Service		A				
HCM Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		28.9				Sum of lost time (s)		8.6				
Intersection Capacity Utilization		55.3%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

39: 21st St & F St





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	216	25	19	166	37	18	412	25	37	380	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			0.95			0.95	
Frt	1.00	1.00	0.85	1.00	0.97			0.99			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1812			3503			3458	
Flt Permitted	0.62	1.00	1.00	0.61	1.00			0.93			0.90	
Satd. Flow (perm)	1156	1863	1583	1141	1812			3252			3109	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	235	27	21	180	40	20	448	27	40	413	66
RTOR Reduction (vph)	0	0	17	0	18	0	0	10	0	0	28	0
Lane Group Flow (vph)	75	235	10	21	202	0	0	485	0	0	491	0
Turn Type	Perm		Perm		Perm		Perm		Perm		Perm	
Protected Phases	4		4		4		2		6		6	
Permitted Phases	4		4		4		2		6		6	
Actuated Green, G (s)	11.8	11.8	11.8	11.8	11.8			11.8			11.8	
Effective Green, g (s)	11.8	11.8	11.8	11.8	11.8			11.8			11.8	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37			0.37			0.37	
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6			4.0			4.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	424	683	580	418	664			1192			1139	
v/s Ratio Prot	c0.13				0.11							
v/s Ratio Perm	0.06		0.01	0.02				0.15			c0.16	
v/c Ratio	0.18	0.34	0.02	0.05	0.30			0.41			0.43	
Uniform Delay, d1	6.9	7.4	6.5	6.6	7.3			7.6			7.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.0	0.1			0.1			0.1	
Delay (s)	7.0	7.5	6.5	6.6	7.4			7.7			7.8	
Level of Service	A	A	A	A	A			A			A	
Approach Delay (s)	7.3				7.3		7.7				7.8	
Approach LOS	A				A		A				A	
Intersection Summary												
HCM Average Control Delay	7.6			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.39											
Actuated Cycle Length (s)	32.2			Sum of lost time (s)			8.6					
Intersection Capacity Utilization	68.9%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

40: 21st St & Q Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	60	11	13	131	14	13	249	11	32	434	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1819		1770	1836		1770	1851		1770	1856	
Flt Permitted	0.66	1.00		0.71	1.00		0.37	1.00		0.59	1.00	
Satd. Flow (perm)	1225	1819		1317	1836		684	1851		1092	1856	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	65	12	14	142	15	14	271	12	35	472	12
RTOR Reduction (vph)	0	8	0	0	9	0	0	4	0	0	2	0
Lane Group Flow (vph)	14	69	0	14	148	0	14	279	0	35	482	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	4			4			2			6		
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	11.5	11.5		11.5	11.5		12.2	12.2		12.2	12.2	
Effective Green, g (s)	11.5	11.5		11.5	11.5		12.2	12.2		12.2	12.2	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	428	636		460	642		254	686		405	688	
v/s Ratio Prot		0.04			c0.08			0.15			c0.26	
v/s Ratio Perm	0.01			0.01			0.02			0.03		
v/c Ratio	0.03	0.11		0.03	0.23		0.06	0.41		0.09	0.70	
Uniform Delay, d1	7.0	7.2		7.0	7.6		6.6	7.7		6.7	8.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1		0.1	0.5		0.1	3.5	
Delay (s)	7.1	7.3		7.1	7.7		6.8	8.2		6.9	12.3	
Level of Service	A	A		A	A		A	A		A	B	
Approach Delay (s)		7.3			7.7			8.1			11.9	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM Average Control Delay	9.8			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.47											
Actuated Cycle Length (s)	32.9			Sum of lost time (s)			9.2					
Intersection Capacity Utilization	48.4%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

40: 21st St & Q Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	112	10	20	75	42	13	1038	10	22	540	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flt	1.00	0.99		1.00	0.95		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1840		1770	1762		1770	1860		1770	1859	
Flt Permitted	0.67	1.00		0.66	1.00		0.37	1.00		0.08	1.00	
Satd. Flow (perm)	1257	1840		1237	1762		685	1860		146	1859	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	122	11	22	82	46	14	1128	11	24	587	7
RTOR Reduction (vph)	0	4	0	0	25	0	0	0	0	0	1	0
Lane Group Flow (vph)	32	129	0	22	103	0	14	1139	0	24	593	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	4			4			2			6		
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	17.1	17.1		17.1	17.1		50.9	50.9		50.9	50.9	
Effective Green, g (s)	17.1	17.1		17.1	17.1		50.9	50.9		50.9	50.9	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.66	0.66		0.66	0.66	
Clearance Time (s)	4.6	4.6		4.6	4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	278	408		274	390		452	1226		96	1226	
v/s Ratio Prot	c0.07			0.06			c0.61			0.32		
v/s Ratio Perm	0.03			0.02			0.02			0.16		
v/c Ratio	0.12	0.32		0.08	0.26		0.03	0.93		0.25	0.48	
Uniform Delay, d1	24.0	25.2		23.8	24.8		4.6	11.6		5.4	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.1	0.3		0.0	12.3		1.9	0.4	
Delay (s)	24.1	25.5		23.9	25.1		4.6	23.8		7.2	7.0	
Level of Service	C	C		C	C		A	C		A	A	
Approach Delay (s)	25.2			24.9			23.6			7.0		
Approach LOS	C			C			C			A		
Intersection Summary												
HCM Average Control Delay			18.9			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			77.2			Sum of lost time (s)			9.2			
Intersection Capacity Utilization			79.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis











41: 21st Street & Union Ave

10/12/2010

												
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	3	18	15	26	13	29	9	39	74	476	1188	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Lane Util. Factor		1.00	1.00		1.00	1.00			1.00	0.91	0.88	
Frt		1.00	0.90		1.00	0.91			1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1770	1685		1770	1690			1770	5085	2787	
Flt Permitted		0.68	1.00		0.73	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1259	1685		1357	1690			1770	5085	2787	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	20	16	28	14	32	10	42	80	517	1291	41
RTOR Reduction (vph)	0	0	26	0	0	31	0	0	0	0	1	0
Lane Group Flow (vph)	0	23	18	0	14	53	0	0	80	517	1331	0
Turn Type	Perm	Perm			Perm				Prot		Over	
Protected Phases			8			8			5	2	7	
Permitted Phases	8	8			8							
Actuated Green, G (s)		6.8	6.8		6.8	6.8			7.8	20.9	58.6	
Effective Green, g (s)		6.8	6.8		6.8	6.8			7.8	20.9	58.6	
Actuated g/C Ratio		0.06	0.06		0.06	0.06			0.07	0.18	0.50	
Clearance Time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Vehicle Extension (s)		0.2	0.2		0.2	0.2			2.0	6.8	8.0	
Lane Grp Cap (vph)		74	99		79	99			119	915	1405	
v/s Ratio Prot			0.01			c0.03			0.05	0.10	c0.48	
v/s Ratio Perm		0.02			0.01							
v/c Ratio		0.31	0.18		0.18	0.53			0.67	0.57	0.95	
Uniform Delay, d1		52.5	52.0		52.0	53.2			53.0	43.5	27.3	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		0.9	0.3		0.4	2.8			11.1	1.9	14.3	
Delay (s)		53.3	52.4		52.4	55.9			64.1	45.4	41.6	
Level of Service		D	D		D	E			E	D	D	
Approach Delay (s)			52.7			55.4				43.6		
Approach LOS			D			E				D		
Intersection Summary												
HCM Average Control Delay			38.9									
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			116.2									
Intersection Capacity Utilization			72.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 41: 21st Street & Union Ave





















10/12/2010

							
Movement	SBL2	SBL	SBT	SBR	SWL	SWR	SWR2
Lane Configurations							
Volume (vph)	23	116	579	15	1347	157	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	5.1		4.7		
Lane Util. Factor		1.00	0.91		0.94		
Frt		1.00	1.00		0.98		
Flt Protected		0.95	1.00		0.96		
Satd. Flow (prot)		1770	5066		4918		
Flt Permitted		0.95	1.00		0.96		
Satd. Flow (perm)		1770	5066		4918		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	126	629	16	1464	171	115
RTOR Reduction (vph)	0	0	2	0	5	0	0
Lane Group Flow (vph)	0	151	643	0	1745	0	0
Turn Type	Prot	Prot					
Protected Phases	1	1	6		7		
Permitted Phases							
Actuated Green, G (s)		10.3	23.4		58.6		
Effective Green, g (s)		10.3	23.4		58.6		
Actuated g/C Ratio		0.09	0.20		0.50		
Clearance Time (s)		4.7	5.1		4.7		
Vehicle Extension (s)		2.0	6.8		8.0		
Lane Grp Cap (vph)		157	1020		2480		
v/s Ratio Prot		c0.09	c0.13		0.35		
v/s Ratio Perm							
v/c Ratio		0.96	0.63		0.70		
Uniform Delay, d1		52.8	42.4		22.1		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		59.8	2.4		1.7		
Delay (s)		112.6	44.9		23.8		
Level of Service		F	D		C		
Approach Delay (s)			57.7		23.8		
Approach LOS			E		C		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

41: 21st Street & Union Ave












10/12/2010

												
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	8	71	23	30	24	14	7	62	92	695	1771	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Lane Util. Factor		1.00	1.00		1.00	1.00			1.00	0.91	0.88	
Frt		1.00	0.91		1.00	0.88			1.00	1.00	0.95	
Flt Protected		0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1770	1704		1770	1630			1770	5085	3115	
Flt Permitted		0.61	1.00		0.72	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1130	1704		1340	1630			1770	5085	3115	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	77	25	33	26	15	8	67	100	755	1925	39
RTOR Reduction (vph)	0	0	30	0	0	61	0	0	0	0	1	0
Lane Group Flow (vph)	0	86	28	0	26	29	0	0	100	755	1963	0
Turn Type	Perm	Perm			Perm				Prot		Over	
Protected Phases			8			8			5	2	7	
Permitted Phases	8	8			8							
Actuated Green, G (s)		13.3	13.3		13.3	13.3			7.3	25.8	73.4	
Effective Green, g (s)		13.3	13.3		13.3	13.3			7.3	25.8	73.4	
Actuated g/C Ratio		0.09	0.09		0.09	0.09			0.05	0.18	0.51	
Clearance Time (s)		5.1	5.1		5.1	5.1			4.7	5.1	4.7	
Vehicle Extension (s)		0.2	0.2		0.2	0.2			2.0	6.8	8.0	
Lane Grp Cap (vph)		105	158		124	151			90	915	1594	
v/s Ratio Prot			0.02			0.02			0.06	0.15	c0.63	
v/s Ratio Perm		c0.08			0.02							
v/c Ratio		0.82	0.18		0.21	0.19			1.11	0.83	1.23	
Uniform Delay, d1		63.9	60.0		60.2	60.1			68.0	56.6	35.0	
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		35.5	0.2		0.3	0.2			128.1	7.4	109.9	
Delay (s)		99.4	60.2		60.5	60.3			196.1	64.1	144.9	
Level of Service		F	E		E	E			F	E	F	
Approach Delay (s)			83.6			60.4				125.0		
Approach LOS			F			E				F		
Intersection Summary												
HCM Average Control Delay			94.2				HCM Level of Service			F		
HCM Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			143.4				Sum of lost time (s)			19.6		
Intersection Capacity Utilization			93.5%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: 21st Street & Union Ave
















10/12/2010

								
Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Volume (vph)	115	14	1050	18	1	1538	59	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.7	5.1			4.7		
Lane Util. Factor		1.00	0.91			0.94		
Frt		1.00	1.00			0.99		
Flt Protected		0.95	1.00			0.95		
Satd. Flow (prot)		1770	5072			4976		
Flt Permitted		0.95	1.00			0.89		
Satd. Flow (perm)		1770	5072			4642		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	15	1141	20	1	1672	64	29
RTOR Reduction (vph)	0	0	1	0	0	1	0	0
Lane Group Flow (vph)	0	140	1160	0	0	1765	0	0
Turn Type	Prot	Prot			Perm			
Protected Phases	1	1	6			7		
Permitted Phases					7			
Actuated Green, G (s)		11.3	29.8			73.4		
Effective Green, g (s)		11.3	29.8			73.4		
Actuated g/C Ratio		0.08	0.21			0.51		
Clearance Time (s)		4.7	5.1			4.7		
Vehicle Extension (s)		2.0	6.8			8.0		
Lane Grp Cap (vph)		139	1054			2376		
v/s Ratio Prot		c0.08	c0.23					
v/s Ratio Perm						0.38		
v/c Ratio		1.01	1.10			0.74		
Uniform Delay, d1		66.0	56.8			27.6		
Progression Factor		1.00	1.00			1.00		
Incremental Delay, d2		78.2	59.6			2.1		
Delay (s)		144.3	116.4			29.7		
Level of Service		F	F			C		
Approach Delay (s)			119.4			29.7		
Approach LOS			F			C		
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

42: 23rd St & F St

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	213	3142	25	0	0	0	0	229	87	404	521	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6		4.2	5.6	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		1.00						0.96		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		5064						3393		1770	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		5064						3393		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	232	3415	27	0	0	0	0	249	95	439	566	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	3674	0	0	0	0	0	334	0	439	566	0
Turn Type	Split									Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases												
Actuated Green, G (s)		84.8						19.2		27.8	51.2	
Effective Green, g (s)		84.8						19.2		27.8	51.2	
Actuated g/C Ratio		0.58						0.13		0.19	0.35	
Clearance Time (s)		5.6						5.6		4.2	5.6	
Vehicle Extension (s)		4.1						3.2		2.0	4.3	
Lane Grp Cap (vph)		2917						443		334	1231	
v/s Ratio Prot		c0.73						c0.10		c0.25	0.16	
v/s Ratio Perm												
v/c Ratio		1.26						0.75		1.31	0.46	
Uniform Delay, d1		31.2						61.7		59.7	37.3	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		119.6						7.3		161.2	0.4	
Delay (s)		150.8						69.0		220.9	37.7	
Level of Service		F						E		F	D	
Approach Delay (s)		150.8			0.0			69.0			117.7	
Approach LOS		F			A			E			F	
Intersection Summary												
HCM Average Control Delay		138.6										
HCM Volume to Capacity ratio		1.20										
Actuated Cycle Length (s)		147.2								15.4		
Intersection Capacity Utilization		109.9%								H		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
























42: 23rd St & F St

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	446	3189	45	0	0	0	0	379	140	349	438	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6		4.2	5.6	
Lane Util. Factor		0.91						0.95		1.00	0.95	
Frt		1.00						0.96		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		5045						3396		1770	3539	
Flt Permitted		0.99						1.00		0.95	1.00	
Satd. Flow (perm)		5045						3396		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	485	3466	49	0	0	0	0	412	152	379	476	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	3999	0	0	0	0	0	555	0	379	476	0
Turn Type	Split									Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases												
Actuated Green, G (s)		88.4						22.4		23.8	50.4	
Effective Green, g (s)		88.4						22.4		23.8	50.4	
Actuated g/C Ratio		0.59						0.15		0.16	0.34	
Clearance Time (s)		5.6						5.6		4.2	5.6	
Vehicle Extension (s)		4.1						3.2		2.0	4.3	
Lane Grp Cap (vph)		2973						507		281	1189	
v/s Ratio Prot		c0.79						c0.16		c0.21	0.13	
v/s Ratio Perm												
v/c Ratio		1.35						1.10		1.35	0.40	
Uniform Delay, d1		30.8						63.8		63.1	38.2	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		157.6						68.6		178.7	0.4	
Delay (s)		188.4						132.4		241.8	38.6	
Level of Service		F						F		F	D	
Approach Delay (s)		188.4			0.0			132.4			128.6	
Approach LOS		F			A			F			F	
Intersection Summary												
HCM Average Control Delay		173.2										
HCM Volume to Capacity ratio		1.30										
Actuated Cycle Length (s)		150.0								15.4		
Intersection Capacity Utilization		119.3%								H		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 43: 23rd St & Chester Ave


















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	  							 	 	 	 	
Volume (vph)	353	2567	153	0	0	0	0	359	132	112	506	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6	5.6	4.2	5.6	
Lane Util. Factor		0.91						0.95	1.00	1.00	0.95	
Frt		0.99						1.00	0.85	1.00	1.00	
Flt Protected		0.99						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5019						3539	1583	1770	3539	
Flt Permitted		0.99						1.00	1.00	0.95	1.00	
Satd. Flow (perm)		5019						3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	384	2790	166	0	0	0	0	390	143	122	550	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	10	0	0	0
Lane Group Flow (vph)	0	3336	0	0	0	0	0	390	133	122	550	0
Turn Type	Split									Perm	Prot	
Protected Phases	2	2						8			7	4
Permitted Phases									8			
Actuated Green, G (s)		83.4						20.9	20.9	8.8	33.9	
Effective Green, g (s)		83.4						20.9	20.9	8.8	33.9	
Actuated g/C Ratio		0.65						0.16	0.16	0.07	0.26	
Clearance Time (s)		5.6						5.6	5.6	4.2	5.6	
Vehicle Extension (s)		4.2						5.3	5.3	2.0	3.9	
Lane Grp Cap (vph)		3257						576	257	121	934	
v/s Ratio Prot		c0.66						c0.11		c0.07	0.16	
v/s Ratio Perm									0.08			
v/c Ratio		1.02						0.68	0.52	1.01	0.59	
Uniform Delay, d1		22.5						50.6	49.2	59.8	41.2	
Progression Factor		1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2		22.3						4.3	3.8	84.0	1.1	
Delay (s)		44.9						55.0	53.0	143.9	42.3	
Level of Service		D						D	D	F	D	
Approach Delay (s)		44.9			0.0			54.4			60.8	
Approach LOS		D			A			D			E	
Intersection Summary												
HCM Average Control Delay		48.3										
HCM Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		128.5										
Intersection Capacity Utilization		95.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

43: 23rd St & Chester Ave

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	3087	132	0	0	0	0	627	220	170	683	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6						5.6	5.6	4.2	5.6	
Lane Util. Factor		0.91						0.95	1.00	1.00	0.95	
Frt		0.99						1.00	0.85	1.00	1.00	
Flt Protected		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5035						3539	1583	1770	3539	
Flt Permitted		1.00						1.00	1.00	0.95	1.00	
Satd. Flow (perm)		5035						3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	3355	143	0	0	0	0	682	239	185	742	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	7	0	0	0
Lane Group Flow (vph)	0	3832	0	0	0	0	0	682	232	185	742	0
Turn Type	Split								Perm	Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases									8			
Actuated Green, G (s)		95.4						26.4	26.4	12.8	43.4	
Effective Green, g (s)		95.4						26.4	26.4	12.8	43.4	
Actuated g/C Ratio		0.64						0.18	0.18	0.09	0.29	
Clearance Time (s)		5.6						5.6	5.6	4.2	5.6	
Vehicle Extension (s)		4.2						5.3	5.3	2.0	3.9	
Lane Grp Cap (vph)		3202						623	279	151	1024	
v/s Ratio Prot		c0.76						c0.19		c0.10	0.21	
v/s Ratio Perm									0.15			
v/c Ratio		1.20						1.09	0.83	1.23	0.72	
Uniform Delay, d1		27.3						61.8	59.7	68.6	47.9	
Progression Factor		1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2		91.9						64.6	20.9	146.3	2.7	
Delay (s)		119.2						126.4	80.5	214.9	50.7	
Level of Service		F						F	F	F	D	
Approach Delay (s)		119.2			0.0			114.5			83.4	
Approach LOS		F			A			F			F	
Intersection Summary												
HCM Average Control Delay		112.6										
HCM Volume to Capacity ratio		1.18										
Actuated Cycle Length (s)		150.0										
Intersection Capacity Utilization		116.5%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

44: 23rd St & Q Street

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	59	87	14	30	19	18	233	4	13	422	68
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	64	95	15	33	21	20	253	4	14	459	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								722			817	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	855	821	496	945	855	255	533			258		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	827	791	452	921	827	255	490			258		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	79	84	91	89	97	98			99		
cM capacity (veh/h)	242	299	582	165	285	783	1028			1307		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	267	68	277	547								
Volume Left	109	15	20	14								
Volume Right	95	21	4	74								
cSH	324	294	1028	1307								
Volume to Capacity	0.83	0.23	0.02	0.01								
Queue Length 95th (ft)	177	22	1	1								
Control Delay (s)	52.3	20.9	0.8	0.3								
Lane LOS	F	C	A	A								
Approach Delay (s)	52.3	20.9	0.8	0.3								
Approach LOS	F	C										
Intersection Summary												
Average Delay			13.6									
Intersection Capacity Utilization			57.1%			ICU Level of Service				B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: 23rd St & Q Street













10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	0	142	8	63	7	421	667	59	108	468	385
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	0	154	9	68	8	458	725	64	117	509	418
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								722			817	
pX, platoon unblocked	0.46	0.46	0.85	0.46	0.46	0.38	0.85			0.38		
vC, conflicting volume	2667	2657	718	2779	2834	757	927			789		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3277	3256	575	3521	3640	0	823			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	65	0	0	98	33			81		
cM capacity (veh/h)	0	1	438	0	1	416	682			623		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	287	85	1247	1045								
Volume Left	133	9	458	117								
Volume Right	154	8	64	418								
cSH	0	1	682	623								
Volume to Capacity	Err	130.56	0.67	0.19								
Queue Length 95th (ft)	Err	Err	129	17								
Control Delay (s)	Err	Err	20.3	5.8								
Lane LOS	F	F	C	A								
Approach Delay (s)	Err	Err	20.3	5.8								
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			148.2%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis


















45: SR-178 & SR 99 SB OFF RAMP

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑					↑	↑↓	
Volume (vph)	0	1403	917	0	1792	611	0	0	0	171	0	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.4		4.4					4.1	4.1	
Lane Util. Factor		0.86	0.86		0.91					0.95	0.95	
Frt		0.97	0.85		0.96					1.00	0.85	
Flt Protected		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (prot)		4648	1362		4891					1681	1509	
Flt Permitted		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (perm)		4648	1362		4891					1681	1509	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1525	997	0	1948	664	0	0	0	186	0	779
RTOR Reduction (vph)	0	47	303	0	61	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1907	265	0	2551	0	0	0	0	167	796	0
Turn Type		Perm								Split		
Protected Phases		2			6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		46.6	46.6		46.6					44.9	44.9	
Effective Green, g (s)		46.6	46.6		46.6					44.9	44.9	
Actuated g/C Ratio		0.47	0.47		0.47					0.45	0.45	
Clearance Time (s)		4.4	4.4		4.4					4.1	4.1	
Vehicle Extension (s)		4.5	4.5		4.5					4.1	4.1	
Lane Grp Cap (vph)		2166	635		2279					755	678	
v/s Ratio Prot		0.41			c0.52					0.10	c0.53	
v/s Ratio Perm			0.19									
v/c Ratio		0.88	0.42		1.12					0.22	1.17	
Uniform Delay, d1		24.2	17.7		26.7					16.9	27.6	
Progression Factor		1.00	1.00		1.00					1.00	1.00	
Incremental Delay, d2		4.8	0.8		60.2					0.2	93.5	
Delay (s)		29.0	18.5		86.9					17.1	121.1	
Level of Service		C	B		F					B	F	
Approach Delay (s)		26.6			86.9			0.0			103.1	
Approach LOS		C			F			A			F	
Intersection Summary												
HCM Average Control Delay			64.5			HCM Level of Service				E		
HCM Volume to Capacity ratio			1.15									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)				8.5		
Intersection Capacity Utilization			82.2%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 45: SR-178 & SR 99 SB OFF RAMP




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1811	1204	0	2226	615	0	0	0	323	0	472
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.4		4.4					4.1	4.1	
Lane Util. Factor		0.86	0.86		0.91					0.95	0.95	
Frt		0.97	0.85		0.97					1.00	0.86	
Flt Protected		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (prot)		4646	1362		4920					1681	1516	
Flt Permitted		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (perm)		4646	1362		4920					1681	1516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1968	1309	0	2420	668	0	0	0	351	0	513
RTOR Reduction (vph)	0	44	308	0	45	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	2487	438	0	3043	0	0	0	0	316	546	0
Turn Type		Perm								Split		
Protected Phases		2			6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		64.6	64.6		64.6					36.9	36.9	
Effective Green, g (s)		64.6	64.6		64.6					36.9	36.9	
Actuated g/C Ratio		0.59	0.59		0.59					0.34	0.34	
Clearance Time (s)		4.4	4.4		4.4					4.1	4.1	
Vehicle Extension (s)		4.5	4.5		4.5					4.1	4.1	
Lane Grp Cap (vph)		2728	800		2889					564	509	
v/s Ratio Prot		0.54			c0.62					0.19	c0.36	
v/s Ratio Perm			0.32									
v/c Ratio		0.91	0.55		1.05					0.56	1.07	
Uniform Delay, d1		20.2	13.8		22.7					29.9	36.6	
Progression Factor		1.00	1.00		1.00					1.00	1.00	
Incremental Delay, d2		5.3	1.2		33.0					1.6	60.8	
Delay (s)		25.5	15.0		55.7					31.5	97.3	
Level of Service		C	B		E					C	F	
Approach Delay (s)		23.1			55.7			0.0			73.3	
Approach LOS		C			E			A			E	
Intersection Summary												
HCM Average Control Delay			43.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				8.5		
Intersection Capacity Utilization			87.3%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: SR-178 & Buck Owens Blvd




















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	302	1407	0	0	2340	730	1297	0	0	198	0	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97			0.97		1.00
Frt	1.00	1.00			1.00	0.85	1.00			1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (prot)	3433	5085			5085	1583	3433			3433		1583
Flt Permitted	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (perm)	3433	5085			5085	1583	3433			3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	328	1529	0	0	2543	793	1410	0	0	215	0	292
RTOR Reduction (vph)	0	0	0	0	0	259	0	0	0	0	0	1
Lane Group Flow (vph)	328	1529	0	0	2543	534	1410	0	0	215	0	291
Turn Type	Prot					Over	Prot			Prot		Over
Protected Phases	5	2			6	4	8			4		5
Permitted Phases												
Actuated Green, G (s)	16.8	78.1			56.1	41.1	41.1			41.1		16.8
Effective Green, g (s)	16.8	78.1			56.1	41.1	41.1			41.1		16.8
Actuated g/C Ratio	0.13	0.60			0.43	0.32	0.32			0.32		0.13
Clearance Time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Vehicle Extension (s)	2.0	4.5			4.5	4.5	3.3			4.5		2.0
Lane Grp Cap (vph)	444	3055			2194	500	1085			1085		205
v/s Ratio Prot	0.10	0.30			c0.50	0.34	c0.41			0.06		c0.18
v/s Ratio Perm												
v/c Ratio	0.74	0.50			1.16	1.07	1.30			0.20		1.42
Uniform Delay, d1	54.5	14.8			37.0	44.4	44.4			32.4		56.6
Progression Factor	1.00	1.00			1.00	1.00	1.00			1.00		1.00
Incremental Delay, d2	5.5	0.2			77.1	59.5	141.6			0.2		215.1
Delay (s)	60.0	15.0			114.1	104.0	186.1			32.6		271.7
Level of Service	E	B			F	F	F			C		F
Approach Delay (s)		23.0			111.7			186.1			170.3	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM Average Control Delay		107.4										
HCM Volume to Capacity ratio		1.25										
Actuated Cycle Length (s)		130.0								16.0		
Intersection Capacity Utilization		110.6%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: SR-178 & Buck Owens Blvd






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	493	1900	0	0	2657	488	1351	0	0	831	0	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97			0.97		1.00
Frt	1.00	1.00			1.00	0.85	1.00			1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (prot)	3433	5085			5085	1583	3433			3433		1583
Flt Permitted	0.95	1.00			1.00	1.00	0.95			0.95		1.00
Satd. Flow (perm)	3433	5085			5085	1583	3433			3433		1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	536	2065	0	0	2888	530	1468	0	0	903	0	712
RTOR Reduction (vph)	0	0	0	0	0	142	0	0	0	0	0	0
Lane Group Flow (vph)	536	2065	0	0	2888	388	1468	0	0	903	0	712
Turn Type	Prot					Over	Prot			Prot		Over
Protected Phases	5	2			6	4	8			4		5
Permitted Phases												
Actuated Green, G (s)	35.8	94.1			53.1	35.1	35.1			35.1		35.8
Effective Green, g (s)	35.8	94.1			53.1	35.1	35.1			35.1		35.8
Actuated g/C Ratio	0.26	0.67			0.38	0.25	0.25			0.25		0.26
Clearance Time (s)	5.2	4.9			4.9	5.9	5.9			5.9		5.2
Vehicle Extension (s)	2.0	4.5			4.5	4.5	3.3			4.5		2.0
Lane Grp Cap (vph)	878	3418			1929	397	861			861		405
v/s Ratio Prot	0.16	0.41			c0.57	0.25	c0.43			0.26		c0.45
v/s Ratio Perm												
v/c Ratio	0.61	0.60			1.50	0.98	1.70			1.05		1.76
Uniform Delay, d1	46.0	12.7			43.4	52.1	52.4			52.4		52.1
Progression Factor	1.00	1.00			1.00	1.00	1.00			1.00		1.00
Incremental Delay, d2	0.9	0.4			226.5	39.3	322.2			44.2		351.1
Delay (s)	46.8	13.1			269.9	91.3	374.7			96.7		403.2
Level of Service	D	B			F	F	F			F		F
Approach Delay (s)		20.0			242.2			374.7			231.8	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM Average Control Delay		198.3				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.63										
Actuated Cycle Length (s)		140.0				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		142.2%				ICU Level of Service		H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: 24th St & Oak St






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	2335	429	602	2790	14	301	11	1147	37	16	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	3433	3537		1681	1691	1583		1759	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.97	
Satd. Flow (perm)	1770	3539	1583	3433	3537		1681	1691	1583		1759	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	2538	466	654	3033	15	327	12	1247	40	17	16
RTOR Reduction (vph)	0	0	84	0	0	0	0	0	358	0	7	0
Lane Group Flow (vph)	28	2538	382	654	3048	0	170	169	889	0	66	0
Turn Type	Prot		Perm	Prot			Split		Over	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases			2									
Actuated Green, G (s)	4.5	62.1	62.1	23.8	83.4		21.8	21.8	23.8		7.3	
Effective Green, g (s)	4.5	62.1	62.1	23.8	83.4		21.8	21.8	23.8		7.3	
Actuated g/C Ratio	0.03	0.46	0.46	0.17	0.61		0.16	0.16	0.17		0.05	
Clearance Time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Vehicle Extension (s)	2.0	5.7	5.7	2.0	5.7		5.6	5.6	2.0		1.0	
Lane Grp Cap (vph)	58	1611	721	599	2163		269	270	276		94	
v/s Ratio Prot	0.02	c0.72		0.19	0.86		c0.10	0.10	c0.56		c0.04	
v/s Ratio Perm			0.24									
v/c Ratio	0.48	1.58	0.53	1.09	1.41		0.63	0.63	3.22		0.71	
Uniform Delay, d1	64.8	37.2	26.7	56.3	26.5		53.6	53.5	56.3		63.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.3	262.0	1.6	64.3	186.9		7.3	7.0	1008.4		17.8	
Delay (s)	67.1	299.1	28.3	120.6	213.4		60.9	60.5	1064.7		81.3	
Level of Service	E	F	C	F	F		E	E	F		F	
Approach Delay (s)		255.3			197.0			850.1			81.3	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			340.5			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.68									
Actuated Cycle Length (s)			136.4			Sum of lost time (s)			21.4			
Intersection Capacity Utilization			153.5%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: 24th St & Oak St













10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	2797	423	1349	2797	42	565	11	1265	52	20	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	3433	3531		1681	1688	1583		1764	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.97	
Satd. Flow (perm)	1770	3539	1583	3433	3531		1681	1688	1583		1764	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	3040	460	1466	3040	46	614	12	1375	57	22	18
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	358	0	6	0
Lane Group Flow (vph)	39	3040	386	1466	3086	0	313	313	1017	0	91	0
Turn Type	Prot		Perm	Prot			Split		Over	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases			2									
Actuated Green, G (s)	6.3	58.8	58.8	25.8	80.3		33.7	33.7	25.8		8.0	
Effective Green, g (s)	6.3	58.8	58.8	25.8	80.3		33.7	33.7	25.8		8.0	
Actuated g/C Ratio	0.04	0.40	0.40	0.17	0.54		0.23	0.23	0.17		0.05	
Clearance Time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Vehicle Extension (s)	2.0	5.7	5.7	2.0	5.7		5.6	5.6	2.0		1.0	
Lane Grp Cap (vph)	75	1409	630	600	1920		384	385	277		96	
v/s Ratio Prot	0.02	c0.86		0.43	0.87		c0.19	0.19	c0.64		c0.05	
v/s Ratio Perm			0.24									
v/c Ratio	0.52	2.16	0.61	2.44	1.61		0.82	0.81	3.67		0.95	
Uniform Delay, d1	69.2	44.4	35.4	61.0	33.7		54.0	54.0	61.0		69.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.0	523.3	2.9	654.5	275.6		14.4	14.2	1210.7		75.2	
Delay (s)	72.2	567.7	38.3	715.5	309.3		68.4	68.2	1271.7		144.9	
Level of Service	E	F	D	F	F		E	E	F		F	
Approach Delay (s)		493.4			440.1			895.2			144.9	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			545.2			HCM Level of Service			F			
HCM Volume to Capacity ratio			2.03									
Actuated Cycle Length (s)			147.7			Sum of lost time (s)			21.4			
Intersection Capacity Utilization			175.2%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: 24TH ST & F St

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↗	↑↑			↑↑	
Volume (vph)	0	0	0	273	2737	119	77	365	0	0	430	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		3.7	4.6			4.6	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frt					0.99		1.00	1.00			0.92	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					5034		1770	3539			3251	
Flt Permitted					1.00		0.95	1.00			1.00	
Satd. Flow (perm)					5034		1770	3539			3251	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	297	2975	129	84	397	0	0	467	554
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	0	0	3398	0	84	397	0	0	1012	0
Turn Type				Split			Prot					
Protected Phases				6	6		3	8			4	
Permitted Phases												
Actuated Green, G (s)					88.4		8.3	52.4			40.4	
Effective Green, g (s)					88.4		8.3	52.4			40.4	
Actuated g/C Ratio					0.59		0.06	0.35			0.27	
Clearance Time (s)					4.6		3.7	4.6			4.6	
Vehicle Extension (s)					4.8		2.0	2.9			5.1	
Lane Grp Cap (vph)					2967		98	1236			876	
v/s Ratio Prot					c0.67		c0.05	0.11			c0.31	
v/s Ratio Perm												
v/c Ratio					1.15		0.86	0.32			1.25dr	
Uniform Delay, d1					30.8		70.3	35.8			54.8	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					69.9		46.6	0.1			82.5	
Delay (s)					100.7		116.9	35.9			137.3	
Level of Service					F		F	D			F	
Approach Delay (s)		0.0			100.7			50.1			137.3	
Approach LOS		A			F			D			F	
Intersection Summary												
HCM Average Control Delay			103.3			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			12.9			
Intersection Capacity Utilization			109.9%			ICU Level of Service			H			
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

48: 24TH ST & F St



















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	210	3359	357	118	352	0	0	375	444
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		3.7	4.6			4.6	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frt					0.99		1.00	1.00			0.92	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					5003		1770	3539			3251	
Flt Permitted					1.00		0.95	1.00			1.00	
Satd. Flow (perm)					5003		1770	3539			3251	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	3651	388	128	383	0	0	408	483
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	4259	0	128	383	0	0	888	0
Turn Type				Split			Prot					
Protected Phases				6	6		3	8			4	
Permitted Phases												
Actuated Green, G (s)					95.4		8.3	45.4			33.4	
Effective Green, g (s)					95.4		8.3	45.4			33.4	
Actuated g/C Ratio					0.64		0.06	0.30			0.22	
Clearance Time (s)					4.6		3.7	4.6			4.6	
Vehicle Extension (s)					4.8		2.0	2.9			5.1	
Lane Grp Cap (vph)					3182		98	1071			724	
v/s Ratio Prot					c0.85		c0.07	0.11			c0.27	
v/s Ratio Perm												
v/c Ratio					1.34		1.31	0.36			1.33dr	
Uniform Delay, d1					27.3		70.8	40.9			58.3	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					154.5		193.5	0.2			113.9	
Delay (s)					181.8		264.4	41.1			172.2	
Level of Service					F		F	D			F	
Approach Delay (s)		0.0			181.8			97.0			172.2	
Approach LOS		A			F			F			F	
Intersection Summary												
HCM Average Control Delay			172.7			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.31									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			12.9			
Intersection Capacity Utilization			119.3%			ICU Level of Service			H			
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: 24TH ST & Chester Ave


















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	252	2739	314	98	525	0	0	497	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		4.2	4.6			4.6	4.6
Lane Util. Factor					0.91		1.00	0.95			0.95	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					4994		1770	3539			3539	1583
Flt Permitted					1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)					4994		1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	274	2977	341	107	571	0	0	540	137
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	8
Lane Group Flow (vph)	0	0	0	0	3584	0	107	571	0	0	540	129
Turn Type				Split			Prot					Prot
Protected Phases				6	6		3	8			4	4
Permitted Phases												
Actuated Green, G (s)					104.2		8.8	36.6			23.6	23.6
Effective Green, g (s)					104.2		8.8	36.6			23.6	23.6
Actuated g/C Ratio					0.69		0.06	0.24			0.16	0.16
Clearance Time (s)					4.6		4.2	4.6			4.6	4.6
Vehicle Extension (s)					4.9		2.0	3.1			5.2	5.2
Lane Grp Cap (vph)					3469		104	864			557	249
v/s Ratio Prot					c0.72		c0.06	0.16			c0.15	0.08
v/s Ratio Perm												
v/c Ratio					1.03		1.03	0.66			0.97	0.52
Uniform Delay, d1					22.9		70.6	51.1			62.8	58.0
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					24.7		96.2	1.9			30.6	3.8
Delay (s)					47.6		166.8	53.0			93.5	61.8
Level of Service					D		F	D			F	E
Approach Delay (s)		0.0			47.6			71.0			87.0	
Approach LOS		A			D			E			F	
Intersection Summary												
HCM Average Control Delay			56.2									
HCM Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			150.0									
Intersection Capacity Utilization			95.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

49: 24TH ST & Chester Ave






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	325	3236	329	183	699	0	0	677	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6		4.2	4.6			4.6	4.6
Lane Util. Factor					0.91		1.00	0.95			0.95	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					5000		1770	3539			3539	1583
Flt Permitted					1.00		0.95	1.00			1.00	1.00
Satd. Flow (perm)					5000		1770	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	353	3517	358	199	760	0	0	736	175
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	7
Lane Group Flow (vph)	0	0	0	0	4221	0	199	760	0	0	736	168
Turn Type				Split			Prot					Prot
Protected Phases				6	6		3	8			4	4
Permitted Phases												
Actuated Green, G (s)					96.4		13.8	44.4			26.4	26.4
Effective Green, g (s)					96.4		13.8	44.4			26.4	26.4
Actuated g/C Ratio					0.64		0.09	0.30			0.18	0.18
Clearance Time (s)					4.6		4.2	4.6			4.6	4.6
Vehicle Extension (s)					4.9		2.0	3.1			5.2	5.2
Lane Grp Cap (vph)					3213		163	1048			623	279
v/s Ratio Prot					c0.84		c0.11	0.21			c0.21	0.11
v/s Ratio Perm												
v/c Ratio					1.31		1.22	0.73			1.18	0.60
Uniform Delay, d1					26.8		68.1	47.3			61.8	57.0
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					143.5		142.1	2.5			97.4	5.6
Delay (s)					170.3		210.2	49.9			159.2	62.5
Level of Service					F		F	D			F	E
Approach Delay (s)		0.0			170.3			83.1			140.6	
Approach LOS		A			F			F			F	
Intersection Summary												
HCM Average Control Delay			152.1				HCM Level of Service			F		
HCM Volume to Capacity ratio			1.28									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			13.4		
Intersection Capacity Utilization			116.5%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

50: Monterey Street & Beale Ave





















10/12/2010

											
Movement	EBL	EBT	EBR	EBR2	NBT	NBR	SBL2	SBT	SBR	NWR2	
Lane Configurations		  			 			 			
Volume (vph)	21	151	35	2	318	139	61	1106	33	16	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.9			4.9	4.9	4.0	4.9		4.9	
Lane Util. Factor		0.91			0.91	0.91	1.00	0.95		1.00	
Frt		0.97			0.99	0.85	1.00	1.00		0.86	
Flt Protected		0.99			1.00	1.00	0.95	1.00		1.00	
Satd. Flow (prot)		4926			3369	1441	1770	3524		1611	
Flt Permitted		0.99			1.00	1.00	0.95	1.00		1.00	
Satd. Flow (perm)		4926			3369	1441	1770	3524		1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	23	164	38	2	346	151	66	1202	36	17	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	12	
Lane Group Flow (vph)	0	227	0	0	361	136	66	1238	0	5	
Turn Type	Perm				Perm		Prot		custom		
Protected Phases		4			2		1	6			
Permitted Phases	4					2				8	
Actuated Green, G (s)		19.6			28.6	28.6	4.2	29.3		19.6	
Effective Green, g (s)		19.6			28.6	28.6	4.2	29.3		19.6	
Actuated g/C Ratio		0.30			0.43	0.43	0.06	0.44		0.30	
Clearance Time (s)		4.9			4.9	4.9	4.0	4.9		4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	2.0		2.0	
Lane Grp Cap (vph)		1458			1455	623	112	1560		477	
v/s Ratio Prot					c0.11		0.04	c0.35			
v/s Ratio Perm		0.05				0.09				0.00	
v/c Ratio		0.16			0.25	0.22	0.59	0.79		0.01	
Uniform Delay, d1		17.2			12.0	11.8	30.2	15.9		16.5	
Progression Factor		1.00			1.00	1.00	1.33	0.54		1.00	
Incremental Delay, d2		0.0			0.0	0.1	6.5	2.2		0.0	
Delay (s)		17.2			12.0	11.9	46.7	10.8		16.5	
Level of Service		B			B	B	D	B		B	
Approach Delay (s)		17.2			12.0			12.6			
Approach LOS		B			B			B			
Intersection Summary											
HCM Average Control Delay		13.0			HCM Level of Service					B	
HCM Volume to Capacity ratio		0.49									
Actuated Cycle Length (s)		66.2			Sum of lost time (s)					9.8	
Intersection Capacity Utilization		44.0%			ICU Level of Service					A	
Analysis Period (min)		15									
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

50: Monterey Street & Beale Ave





















10/12/2010

										
Movement	EBL	EBT	EBR	EBR2	NBT	NBR	SBL2	SBT	SBR	NWR2
Lane Configurations		  			 			 		
Volume (vph)	104	483	66	15	674	242	56	712	21	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.0	4.9		4.9
Lane Util. Factor		0.91			0.91	0.91	1.00	0.95		1.00
Frt		0.98			0.99	0.85	1.00	1.00		0.86
Flt Protected		0.99			1.00	1.00	0.95	1.00		1.00
Satd. Flow (prot)		4954			3373	1441	1770	3524		1611
Flt Permitted		0.99			1.00	1.00	0.95	1.00		1.00
Satd. Flow (perm)		4954			3373	1441	1770	3524		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	113	525	72	16	733	263	61	774	23	26
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	18
Lane Group Flow (vph)	0	726	0	0	759	237	61	797	0	8
Turn Type	Perm				Perm		Prot	custom		
Protected Phases	4				2		1	6		
Permitted Phases	4				2				8	
Actuated Green, G (s)	14.6				18.6		3.2	18.4	14.6	
Effective Green, g (s)	14.6				18.6		3.2	18.4	14.6	
Actuated g/C Ratio	0.29				0.37		0.06	0.37	0.29	
Clearance Time (s)	4.9				4.9		4.0	4.9	4.9	
Vehicle Extension (s)	2.0				2.0		1.0	2.0	2.0	
Lane Grp Cap (vph)	1441				1250		534	113	1292	469
v/s Ratio Prot					c0.23		0.03	c0.23		
v/s Ratio Perm	0.15				0.16				0.00	
v/c Ratio	0.50				0.61		0.44	0.54	0.62	0.02
Uniform Delay, d1	14.8				12.8		11.9	22.8	13.0	12.7
Progression Factor	1.00				1.00		1.00	1.30	0.61	1.00
Incremental Delay, d2	0.1				0.6		0.2	2.3	0.6	0.0
Delay (s)	14.9				13.4		12.1	32.0	8.5	12.7
Level of Service	B				B		B	C	A	B
Approach Delay (s)	14.9				13.1			10.1		
Approach LOS	B				B			B		
Intersection Summary										
HCM Average Control Delay	12.6				HCM Level of Service				B	
HCM Volume to Capacity ratio	0.54									
Actuated Cycle Length (s)	50.2				Sum of lost time (s)				9.8	
Intersection Capacity Utilization	56.7%				ICU Level of Service				B	
Analysis Period (min)	15									
c Critical Lane Group										

HCM Signalized Intersection Capacity Analysis

51: Golden State Ave & Q Street





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	223	1607	336	0	590	66	74	176	34	86	181	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.91			0.91		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97			0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4953			5008		1770	3453		1770	1863	1583
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4953			5008		1770	3453		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	1747	365	0	641	72	80	191	37	93	197	55
RTOR Reduction (vph)	0	31	0	0	14	0	0	17	0	0	0	45
Lane Group Flow (vph)	242	2081	0	0	699	0	80	211	0	93	197	10
Turn Type	Prot						Split			Split		Perm
Protected Phases	1	6			2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	13.6	39.0			21.7		10.0	10.0		13.7	13.7	13.7
Effective Green, g (s)	13.6	39.0			21.7		10.0	10.0		13.7	13.7	13.7
Actuated g/C Ratio	0.18	0.51			0.28		0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	1.5	4.5			4.5		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	313	2515			1415		230	450		316	332	282
v/s Ratio Prot	0.14	c0.42			0.14		0.05	c0.06		0.05	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.77	0.83			0.49		0.35	0.47		0.29	0.59	0.03
Uniform Delay, d1	30.1	16.0			23.0		30.4	30.9		27.4	29.0	26.1
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.3	2.6			0.5		0.9	0.8		0.5	2.8	0.1
Delay (s)	40.5	18.6			23.4		31.3	31.7		27.9	31.8	26.1
Level of Service	D	B			C		C	C		C	C	C
Approach Delay (s)		20.9			23.4			31.6			29.9	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			23.1				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			76.8				Sum of lost time (s)			14.1		
Intersection Capacity Utilization			68.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

51: Golden State Ave & Q Street
























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1030	2471	681	0	699	82	351	381	75	80	279	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Lane Util. Factor	1.00	0.91			0.91		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97			0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4921			5005		1770	3451		1770	1863	1583
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4921			5005		1770	3451		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1120	2686	740	0	760	89	382	414	82	87	303	189
RTOR Reduction (vph)	0	33	0	0	9	0	0	11	0	0	0	156
Lane Group Flow (vph)	1120	3393	0	0	840	0	382	485	0	87	303	33
Turn Type	Prot						Split			Split		Perm
Protected Phases	1	6			2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	60.3	85.5			21.5		23.4	23.4		26.1	26.1	26.1
Effective Green, g (s)	60.3	85.5			21.5		23.4	23.4		26.1	26.1	26.1
Actuated g/C Ratio	0.40	0.57			0.14		0.16	0.16		0.18	0.18	0.18
Clearance Time (s)	3.7	4.9			4.9		4.6	4.6		4.6	4.6	4.6
Vehicle Extension (s)	1.5	4.5			4.5		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	716	2822			722		278	542		310	326	277
v/s Ratio Prot	c0.63	c0.69			0.17		c0.22	0.14		0.05	c0.16	
v/s Ratio Perm												0.02
v/c Ratio	1.56	1.20			1.16		1.37	0.89		0.28	0.93	0.12
Uniform Delay, d1	44.4	31.8			63.8		62.8	61.6		53.4	60.6	51.8
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	260.7	94.7			88.1		189.5	17.1		0.5	31.7	0.2
Delay (s)	305.1	126.5			151.9		252.3	78.8		53.9	92.3	52.0
Level of Service	F	F			F		F	E		D	F	D
Approach Delay (s)		170.5			151.9			154.3			73.4	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM Average Control Delay		157.9										
HCM Volume to Capacity ratio		1.32										
Actuated Cycle Length (s)		149.1										
Intersection Capacity Utilization		121.6%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

52: Espee St & Union Ave


















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  			  	
Volume (vph)	238	199	51	0	0	0	0	919	553	154	1614	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.4		3.7	4.4	
Lane Util. Factor	1.00	0.91						0.91		1.00	0.91	
Frt	1.00	0.97						0.94		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	4930						4799		1770	5085	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1770	4930						4799		1770	5085	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	216	55	0	0	0	0	999	601	167	1754	0
RTOR Reduction (vph)	0	10	0	0	0	0	0	162	0	0	0	0
Lane Group Flow (vph)	259	261	0	0	0	0	0	1438	0	167	1754	0
Turn Type	Split						Prot					
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.5	13.5						22.4		6.3	32.4	
Effective Green, g (s)	13.5	13.5						22.4		6.3	32.4	
Actuated g/C Ratio	0.25	0.25						0.41		0.12	0.60	
Clearance Time (s)	4.1	4.1						4.4		3.7	4.4	
Vehicle Extension (s)	3.0	3.0						4.0		2.0	4.0	
Lane Grp Cap (vph)	439	1223						1976		205	3029	
v/s Ratio Prot	c0.15	0.05						c0.30		c0.09	0.34	
v/s Ratio Perm												
v/c Ratio	0.59	0.21						0.73		0.81	0.58	
Uniform Delay, d1	18.0	16.2						13.4		23.5	6.8	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.1						1.5		20.4	0.3	
Delay (s)	20.0	16.3						14.9		43.9	7.1	
Level of Service	C	B						B		D	A	
Approach Delay (s)		18.1			0.0			14.9			10.3	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM Average Control Delay		13.1			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		54.4			Sum of lost time (s)			12.2				
Intersection Capacity Utilization		62.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

52: Espee St & Union Ave

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	920	219	0	0	0	0	910	1450	330	1569	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.4		3.7	4.4	
Lane Util. Factor	1.00	0.91						0.91		1.00	0.91	
Frt	1.00	0.97						0.91		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	4939						4617		1770	5085	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1770	4939						4617		1770	5085	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	1000	238	0	0	0	0	989	1576	359	1705	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	17	0	0	0	0
Lane Group Flow (vph)	239	1208	0	0	0	0	0	2548	0	359	1705	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	28.9	28.9						65.6		23.3	92.6	
Effective Green, g (s)	28.9	28.9						65.6		23.3	92.6	
Actuated g/C Ratio	0.22	0.22						0.50		0.18	0.71	
Clearance Time (s)	4.1	4.1						4.4		3.7	4.4	
Vehicle Extension (s)	3.0	3.0						4.0		2.0	4.0	
Lane Grp Cap (vph)	393	1098						2330		317	3622	
v/s Ratio Prot	0.14	c0.24						c0.55		c0.20	0.34	
v/s Ratio Perm												
v/c Ratio	0.61	1.10						1.90dr		1.13	0.47	
Uniform Delay, d1	45.5	50.6						32.2		53.4	8.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.7	58.8						49.7		91.3	0.1	
Delay (s)	48.1	109.3						81.9		144.7	8.2	
Level of Service	D	F						F		F	A	
Approach Delay (s)		99.4			0.0			81.9			32.0	
Approach LOS		F			A			F			C	

Intersection Summary

HCM Average Control Delay	69.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		


















dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

53: Niles St & Beale Ave


















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	316	617	57	44	293	0	0	829	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.9	4.9		4.0	4.9			4.9	
Lane Util. Factor				0.91	0.91		1.00	0.95			0.95	
Frt				1.00	0.99		1.00	1.00			0.99	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1610	3342		1770	3539			3490	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1610	3342		1770	3539			3490	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	343	671	62	48	318	0	0	901	92
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	0	309	759	0	48	318	0	0	984	0
Turn Type				Perm			Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				19.6	19.6		3.5	28.6			29.3	
Effective Green, g (s)				19.6	19.6		3.5	28.6			29.3	
Actuated g/C Ratio				0.30	0.30		0.05	0.43			0.44	
Clearance Time (s)				4.9	4.9		4.0	4.9			4.9	
Vehicle Extension (s)				2.0	2.0		1.0	2.0			2.0	
Lane Grp Cap (vph)				477	989		94	1529			1545	
v/s Ratio Prot							c0.03	0.09			c0.28	
v/s Ratio Perm				0.19	0.23							
v/c Ratio				0.65	0.77		0.51	0.21			0.64	
Uniform Delay, d1				20.3	21.2		30.5	11.7			14.3	
Progression Factor				1.00	1.00		0.59	0.45			1.00	
Incremental Delay, d2				2.3	3.3		1.9	0.0			0.6	
Delay (s)				22.6	24.5		19.9	5.3			15.0	
Level of Service				C	C		B	A			B	
Approach Delay (s)		0.0			23.9			7.2			15.0	
Approach LOS		A			C			A			B	
Intersection Summary												
HCM Average Control Delay			17.8			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			66.2			Sum of lost time (s)			13.8			
Intersection Capacity Utilization			59.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

53: Niles St & Beale Ave













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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	254	429	93	67	734	0	0	503	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.9	4.9		4.0	4.9			4.9	
Lane Util. Factor				0.91	0.91		1.00	0.95			0.95	
Frt				1.00	0.97		1.00	1.00			0.98	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1610	3296		1770	3539			3470	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1610	3296		1770	3539			3470	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	276	466	101	73	798	0	0	547	82
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	0	0	248	568	0	73	798	0	0	613	0
Turn Type				Perm			Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8								
Actuated Green, G (s)				14.6	14.6		3.4	18.6			18.4	
Effective Green, g (s)				14.6	14.6		3.4	18.6			18.4	
Actuated g/C Ratio				0.29	0.29		0.07	0.37			0.37	
Clearance Time (s)				4.9	4.9		4.0	4.9			4.9	
Vehicle Extension (s)				2.0	2.0		1.0	2.0			2.0	
Lane Grp Cap (vph)				468	959		120	1311			1272	
v/s Ratio Prot							0.04	c0.23			c0.18	
v/s Ratio Perm				0.15	0.17							
v/c Ratio				0.53	0.59		0.61	0.61			0.48	
Uniform Delay, d1				14.9	15.3		22.8	12.8			12.2	
Progression Factor				1.00	1.00		0.74	0.78			1.00	
Incremental Delay, d2				0.5	0.7		5.2	0.5			0.1	
Delay (s)				15.4	15.9		22.1	10.5			12.3	
Level of Service				B	B		C	B			B	
Approach Delay (s)		0.0			15.8			11.4			12.3	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			50.2			Sum of lost time (s)			14.7			
Intersection Capacity Utilization			46.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

54: Niles Street & Williams St

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	260	1	0	693	11	0	0	56	0	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	283	1	0	753	12	0	0	61	0	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		471										
pX, platoon unblocked												
vC, conflicting volume	765			284			660	1048	142	901	1043	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	765			284			660	1048	142	901	1043	383
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	97
cM capacity (veh/h)	844			1276			339	226	880	217	228	615
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	188	95	502	263	61	17						
Volume Left	0	0	0	0	0	0						
Volume Right	0	1	0	12	61	17						
cSH	1700	1700	1700	1700	880	615						
Volume to Capacity	0.11	0.06	0.30	0.15	0.07	0.03						
Queue Length 95th (ft)	0	0	0	0	6	2						
Control Delay (s)	0.0	0.0	0.0	0.0	9.4	11.0						
Lane LOS					A	B						
Approach Delay (s)	0.0		0.0		9.4	11.0						
Approach LOS					A	B						
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			29.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

54: Niles Street & Williams St





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	767	31	0	643	54	0	0	51	0	0	26
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	834	34	0	699	59	0	0	55	0	0	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		471										
pX, platoon unblocked												
vC, conflicting volume	758			867			1200	1608	434	1145	1596	379
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	758			867			1200	1608	434	1145	1596	379
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	90	100	100	95
cM capacity (veh/h)	849			772			134	104	570	139	106	619
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	556	312	466	292	55	28						
Volume Left	0	0	0	0	0	0						
Volume Right	0	34	0	59	55	28						
cSH	1700	1700	1700	1700	570	619						
Volume to Capacity	0.33	0.18	0.27	0.17	0.10	0.05						
Queue Length 95th (ft)	0	0	0	0	8	4						
Control Delay (s)	0.0	0.0	0.0	0.0	12.0	11.1						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		12.0	11.1						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			32.2%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

55: Niles Street & MT Vernon Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	191	97	243	516	90	136	678	52	201	438	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3361		3433	3460		3433	3968		3433	3946	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3361		3433	3460		3433	3968		3433	3946	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	208	105	264	561	98	148	737	57	218	476	58
RTOR Reduction (vph)	0	76	0	0	16	0	0	7	0	0	10	0
Lane Group Flow (vph)	65	237	0	264	643	0	148	787	0	218	524	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.0	15.7		10.0	21.7		7.0	17.5		7.7	18.2	
Effective Green, g (s)	4.0	15.7		10.0	21.7		7.0	17.5		7.7	18.2	
Actuated g/C Ratio	0.06	0.23		0.14	0.31		0.10	0.25		0.11	0.26	
Clearance Time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Vehicle Extension (s)	1.0	2.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	102	764		497	1087		348	1005		383	1039	
v/s Ratio Prot	c0.04	0.07		c0.08	c0.19		0.04	c0.20		c0.06	0.13	
v/s Ratio Perm												
v/c Ratio	0.64	0.31		0.53	0.59		0.43	0.78		0.57	0.50	
Uniform Delay, d1	31.8	22.2		27.4	20.0		29.2	24.0		29.1	21.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	0.1		0.5	0.6		0.3	3.7		1.2	0.1	
Delay (s)	41.1	22.3		27.9	20.5		29.5	27.8		30.3	21.8	
Level of Service	D	C		C	C		C	C		C	C	
Approach Delay (s)		25.5			22.7			28.0			24.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		25.1					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		69.1					Sum of lost time (s)		12.2			
Intersection Capacity Utilization		64.9%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

55: Niles Street & MT Vernon Ave

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	635	130	260	433	114	216	725	74	388	689	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	16	12	12	16	12
Total Lost time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Lane Util. Factor	1.00	0.95		0.97	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3449		3433	3429		3433	3956		3433	3975	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3449		3433	3429		3433	3956		3433	3975	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	690	141	283	471	124	235	788	80	422	749	48
RTOR Reduction (vph)	0	19	0	0	25	0	0	9	0	0	5	0
Lane Group Flow (vph)	92	812	0	283	570	0	235	859	0	422	792	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.1	24.0		9.6	27.5		8.9	21.3		11.0	23.4	
Effective Green, g (s)	6.1	24.0		9.6	27.5		8.9	21.3		11.0	23.4	
Actuated g/C Ratio	0.07	0.29		0.11	0.33		0.11	0.25		0.13	0.28	
Clearance Time (s)	3.1	6.0		3.1	6.0		3.1	6.0		3.1	6.0	
Vehicle Extension (s)	1.0	2.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	128	984		392	1121		363	1002		449	1106	
v/s Ratio Prot	0.05	c0.24		c0.08	0.17		0.07	c0.22		c0.12	0.20	
v/s Ratio Perm												
v/c Ratio	0.72	0.82		0.72	0.51		0.65	0.86		0.94	0.72	
Uniform Delay, d1	38.2	28.1		36.0	22.8		36.1	30.0		36.2	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.8	5.4		5.5	0.1		3.0	7.1		27.3	1.9	
Delay (s)	53.0	33.5		41.4	23.0		39.1	37.0		63.5	29.2	
Level of Service	D	C		D	C		D	D		E	C	
Approach Delay (s)		35.5			28.9			37.5			41.1	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM Average Control Delay			36.3			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			84.1			Sum of lost time (s)			18.2			
Intersection Capacity Utilization			79.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

56: 28th ST & M ST

10/12/2010













												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Volume (vph)	14	24	37	3	22	212	139	146	11	64	20	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	12	16	12	12
Total Lost time (s)		5.2	5.2				5.2			5.2		
Lane Util. Factor		1.00	1.00				1.00			1.00		
Frt		1.00	0.85				0.96			0.95		
Flt Protected		0.95	1.00				0.98			1.00		
Satd. Flow (prot)		1770	1583				1986			1993		
Flt Permitted		0.95	1.00				0.74			0.94		
Satd. Flow (perm)		1770	1583				1503			1888		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	26	40	3	24	230	151	159	12	70	22	29
RTOR Reduction (vph)	0	0	2	0	0	0	9	0	0	6	0	0
Lane Group Flow (vph)	0	41	41	0	0	0	555	0	0	127	0	0
Turn Type	Split		Perm		Perm	Perm			Perm			
Protected Phases	3	3					4			4		
Permitted Phases			3		4	4			4			
Actuated Green, G (s)		5.4	5.4				42.8			42.8		
Effective Green, g (s)		5.4	5.4				42.8			42.8		
Actuated g/C Ratio		0.04	0.04				0.29			0.29		
Clearance Time (s)		5.2	5.2				5.2			5.2		
Vehicle Extension (s)		2.0	2.0				4.5			4.5		
Lane Grp Cap (vph)		64	57				433			543		
v/s Ratio Prot		0.02										
v/s Ratio Perm			c0.03				c0.37			0.07		
v/c Ratio		0.64	0.72				1.28			0.23		
Uniform Delay, d1		70.7	70.9				53.0			40.4		
Progression Factor		1.00	1.00				1.00			1.00		
Incremental Delay, d2		15.2	31.3				143.3			0.4		
Delay (s)		85.9	102.2				196.2			40.8		
Level of Service		F	F				F			D		
Approach Delay (s)		94.2					196.2			40.8		
Approach LOS		F					F			D		
Intersection Summary												
HCM Average Control Delay			197.1				HCM Level of Service			F		
HCM Volume to Capacity ratio			1.37									
Actuated Cycle Length (s)			148.7				Sum of lost time (s)			21.5		
Intersection Capacity Utilization			126.0%				ICU Level of Service			H		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

56: 28th ST & M ST



















10/12/2010

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Volume (vph)	55	2395	226	37	69	105	3196	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12
Total Lost time (s)	5.2	5.9				5.2	5.9	
Lane Util. Factor	1.00	0.91				1.00	0.91	
Frt	1.00	0.99				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1770	5010				1770	5080	
Flt Permitted	0.95	1.00				0.95	1.00	
Satd. Flow (perm)	1770	5010				1770	5080	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	2603	246	40	75	114	3474	22
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	60	2888	0	0	0	189	3495	0
Turn Type	Prot				Prot	Prot		
Protected Phases	1	6			5	5	2	
Permitted Phases								
Actuated Green, G (s)	6.7	67.2				11.8	72.3	
Effective Green, g (s)	6.7	67.2				11.8	72.3	
Actuated g/C Ratio	0.05	0.45				0.08	0.49	
Clearance Time (s)	5.2	5.9				5.2	5.9	
Vehicle Extension (s)	2.0	3.6				2.0	4.3	
Lane Grp Cap (vph)	80	2264				140	2470	
v/s Ratio Prot	0.03	0.58				c0.11	c0.69	
v/s Ratio Perm								
v/c Ratio	0.75	1.28				1.35	1.42	
Uniform Delay, d1	70.2	40.7				68.4	38.2	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	29.0	127.6				197.1	189.3	
Delay (s)	99.2	168.3				265.6	227.5	
Level of Service	F	F				F	F	
Approach Delay (s)		166.9					229.4	
Approach LOS		F					F	
Intersection Summary								

HCM Signalized Intersection Capacity Analysis


56: 28th ST & M ST

10/12/2010

												
Movement	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	SEL	SET
Lane Configurations												
Volume (vph)	28	7	29	304	40	48	17	67	4	12	65	4381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12	12	16	12	12	12	12
Total Lost time (s)		5.2	5.2		5.2			5.2			5.2	5.9
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	0.91
Frt		1.00	0.85		0.98			0.98			1.00	1.00
Flt Protected		0.95	1.00		0.96			0.99			0.95	1.00
Satd. Flow (prot)		1770	1583		1999			2049			1770	5066
Flt Permitted		0.95	1.00		0.65			0.95			0.95	1.00
Satd. Flow (perm)		1770	1583		1358			1957			1770	5066
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	8	32	330	43	52	18	73	4	13	71	4762
RTOR Reduction (vph)	0	0	0	0	3	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	38	32	0	422	0	0	105	0	0	71	4888
Turn Type	Split		Perm	Perm			Perm				Prot	
Protected Phases	3	3			4			4			1	6
Permitted Phases			3	4			4					
Actuated Green, G (s)		5.3	5.3		34.8			34.8			6.8	77.2
Effective Green, g (s)		5.3	5.3		34.8			34.8			6.8	77.2
Actuated g/C Ratio		0.04	0.04		0.23			0.23			0.05	0.52
Clearance Time (s)		5.2	5.2		5.2			5.2			5.2	5.9
Vehicle Extension (s)		2.0	2.0		4.5			4.5			2.0	3.6
Lane Grp Cap (vph)		63	56		318			458			81	2632
v/s Ratio Prot		c0.02									0.04	c0.96
v/s Ratio Perm			0.02		c0.31			0.05				
v/c Ratio		0.60	0.57		1.33			0.23			0.88	1.86
Uniform Delay, d1		70.6	70.5		56.9			46.0			70.5	35.7
Progression Factor		1.00	1.00		1.00			1.00			1.00	1.00
Incremental Delay, d2		10.7	8.5		167.3			0.4			58.7	387.1
Delay (s)		81.3	79.0		224.2			46.5			129.2	422.8
Level of Service		F	E		F			D			F	F
Approach Delay (s)		80.2			224.2			46.5				418.6
Approach LOS		F			F			D				F
Intersection Summary												
HCM Average Control Delay			320.7			HCM Level of Service					F	
HCM Volume to Capacity ratio			1.71									
Actuated Cycle Length (s)			148.6			Sum of lost time (s)			27.4			
Intersection Capacity Utilization			147.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 56: 28th ST & M ST




















10/12/2010

						
Movement	SER	SER2	NWL2	NWL	NWT	NWR
Approach Configurations				↰	↑↑↑	
Volume (vph)	96	20	112	50	3480	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)				5.2	5.9	
Lane Util. Factor				1.00	0.91	
Frt				1.00	1.00	
Flt Protected				0.95	1.00	
Satd. Flow (prot)				1770	5075	
Flt Permitted				0.95	1.00	
Satd. Flow (perm)				1770	5075	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	22	122	54	3783	51
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	176	3833	0
Turn Type			Prot	Prot		
Protected Phases			5	5	2	
Permitted Phases						
Actuated Green, G (s)				9.8	80.2	
Effective Green, g (s)				9.8	80.2	
Actuated g/C Ratio				0.07	0.54	
Clearance Time (s)				5.2	5.9	
Vehicle Extension (s)				2.0	4.3	
Lane Grp Cap (vph)				117	2739	
v/s Ratio Prot				c0.10	c0.76	
v/s Ratio Perm						
v/c Ratio				1.50	1.40	
Uniform Delay, d1				69.4	34.2	
Progression Factor				1.00	1.00	
Incremental Delay, d2				266.1	182.0	
Delay (s)				335.5	216.2	
Level of Service				F	F	
Approach Delay (s)					221.5	
Approach LOS					F	
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

57: W Niles St & Union Ave















10/12/2010

								
Movement	WBL2	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations			  			  	  	
Volume (vph)	74	839	1309	128	232	768	890	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12
Total Lost time (s)		4.1	4.1		3.7	4.4	4.4	
Lane Util. Factor		0.86	0.86		1.00	0.91	0.91	
Frt		1.00	0.99		1.00	1.00	0.97	
Flt Protected		0.95	0.99		0.95	1.00	1.00	
Satd. Flow (prot)		1725	4709		1770	5085	4918	
Flt Permitted		0.95	0.99		0.95	1.00	1.00	
Satd. Flow (perm)		1725	4709		1770	5085	4918	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	912	1423	139	252	835	967	271
RTOR Reduction (vph)	0	8	12	0	0	0	27	0
Lane Group Flow (vph)	0	619	1915	0	252	835	1211	0
Turn Type	Split	Split			Prot			
Protected Phases	8	8	8		5	2	6	
Permitted Phases								
Actuated Green, G (s)		29.1	29.1		10.3	32.0	18.0	
Effective Green, g (s)		29.1	29.1		10.3	32.0	18.0	
Actuated g/C Ratio		0.42	0.42		0.15	0.46	0.26	
Clearance Time (s)		4.1	4.1		3.7	4.4	4.4	
Vehicle Extension (s)		3.0	3.0		2.0	0.2	0.2	
Lane Grp Cap (vph)		721	1969		262	2338	1272	
v/s Ratio Prot		0.36	c0.41		c0.14	0.16	c0.25	
v/s Ratio Perm								
v/c Ratio		0.86	0.97		0.96	0.36	0.95	
Uniform Delay, d1		18.4	19.9		29.5	12.2	25.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		10.0	14.3		44.6	0.0	15.0	
Delay (s)		28.4	34.2		74.1	12.2	40.4	
Level of Service		C	C		E	B	D	
Approach Delay (s)			32.8			26.5	40.4	
Approach LOS			C			C	D	
Intersection Summary								
HCM Average Control Delay			33.3		HCM Level of Service		C	
HCM Volume to Capacity ratio			0.96					
Actuated Cycle Length (s)			69.6		Sum of lost time (s)		12.2	
Intersection Capacity Utilization			81.0%		ICU Level of Service		D	
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

57: W Niles St & Union Ave

10/12/2010





















								
Movement	WBL2	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	51	619	1038	242	331	839	1225	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12
Total Lost time (s)		4.1	4.1		3.7	4.4	4.4	
Lane Util. Factor		0.86	0.86		1.00	0.91	0.91	
Frt		1.00	0.98		1.00	1.00	0.97	
Flt Protected		0.95	0.99		0.95	1.00	1.00	
Satd. Flow (prot)		1725	4657		1770	5085	4944	
Flt Permitted		0.95	0.99		0.95	1.00	1.00	
Satd. Flow (perm)		1725	4657		1770	5085	4944	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	673	1128	263	360	912	1332	304
RTOR Reduction (vph)	0	5	30	0	0	0	31	0
Lane Group Flow (vph)	0	521	1563	0	360	912	1605	0
Turn Type	Split	Split			Prot			
Protected Phases	8	8	8		5	2	6	
Permitted Phases								
Actuated Green, G (s)		29.4	29.4		18.3	51.9	29.9	
Effective Green, g (s)		29.4	29.4		18.3	51.9	29.9	
Actuated g/C Ratio		0.33	0.33		0.20	0.58	0.33	
Clearance Time (s)		4.1	4.1		3.7	4.4	4.4	
Vehicle Extension (s)		3.0	3.0		2.0	0.2	0.2	
Lane Grp Cap (vph)		565	1525		361	2939	1646	
v/s Ratio Prot		0.30	c0.34		c0.20	0.18	c0.32	
v/s Ratio Perm								
v/c Ratio		0.92	1.03		1.00	0.31	0.98	
Uniform Delay, d1		29.1	30.2		35.7	9.7	29.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		20.8	29.7		46.3	0.0	16.5	
Delay (s)		49.9	59.9		82.0	9.8	46.0	
Level of Service		D	E		F	A	D	
Approach Delay (s)			57.4			30.2	46.0	
Approach LOS			E			C	D	
Intersection Summary								
HCM Average Control Delay			46.8		HCM Level of Service		D	
HCM Volume to Capacity ratio			1.00					
Actuated Cycle Length (s)			89.8		Sum of lost time (s)		12.2	
Intersection Capacity Utilization			88.0%		ICU Level of Service		E	
Analysis Period (min)			15					

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

58: 30th St & F St





















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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	89	19	122	78	144	36	179	62	373	594	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.90		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1813		1770	1681		1770	3403		1770	3481	
Flt Permitted	0.52	1.00		0.68	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	965	1813		1269	1681		1770	3403		1770	3481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	97	21	133	85	157	39	195	67	405	646	79
RTOR Reduction (vph)	0	12	0	0	105	0	0	50	0	0	12	0
Lane Group Flow (vph)	34	106	0	133	137	0	39	212	0	405	713	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases	4			4			5			1		
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	10.0	10.0		10.0	10.0		3.0	13.3		15.4	25.7	
Effective Green, g (s)	10.0	10.0		10.0	10.0		3.0	13.3		15.4	25.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.06	0.25		0.29	0.49	
Clearance Time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	184	346		242	321		101	864		520	1707	
v/s Ratio Prot		0.06			0.08		0.02	c0.06		c0.23	c0.20	
v/s Ratio Perm	0.04			c0.10								
v/c Ratio	0.18	0.31		0.55	0.43		0.39	0.25		0.78	0.42	
Uniform Delay, d1	17.8	18.2		19.2	18.7		23.8	15.6		16.9	8.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		1.4	0.3		0.9	0.1		6.6	0.1	
Delay (s)	18.0	18.4		20.5	19.0		24.7	15.6		23.6	8.6	
Level of Service	B	B		C	B		C	B		C	A	
Approach Delay (s)		18.3			19.5			16.8			14.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			15.8			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			52.4			Sum of lost time (s)				9.1		
Intersection Capacity Utilization			62.6%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

58: 30th St & F St





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	140	52	164	109	363	42	539	98	293	398	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flt	1.00	0.96		1.00	0.88		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1787		1770	1648		1770	3457		1770	3464	
Flt Permitted	0.21	1.00		0.60	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	393	1787		1121	1648		1770	3457		1770	3464	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	152	57	178	118	395	46	586	107	318	433	72
RTOR Reduction (vph)	0	19	0	0	172	0	0	22	0	0	18	0
Lane Group Flow (vph)	134	190	0	178	341	0	46	671	0	318	487	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases	4			4			5			1		
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	23.9	23.9		23.9	23.9		5.6	19.4		13.0	26.8	
Effective Green, g (s)	23.9	23.9		23.9	23.9		5.6	19.4		13.0	26.8	
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.08	0.28		0.19	0.38	
Clearance Time (s)	5.1	5.1		5.1	5.1		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	1.5	1.5		1.5	1.5		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)	134	610		383	563		142	958		329	1326	
v/s Ratio Prot		0.11			0.21		0.03	c0.19		c0.18	0.14	
v/s Ratio Perm	c0.34			0.16								
v/c Ratio	1.00	0.31		0.46	0.61		0.32	0.70		0.97	0.37	
Uniform Delay, d1	23.0	17.0		18.0	19.1		30.4	22.7		28.3	15.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	77.7	0.1		0.3	1.3		0.5	1.9		40.1	0.1	
Delay (s)	100.8	17.1		18.4	20.4		30.9	24.6		68.4	15.6	
Level of Service	F	B		B	C		C	C		E	B	
Approach Delay (s)		49.8			19.9			25.0			36.0	
Approach LOS		D			B			C			D	
Intersection Summary												
HCM Average Control Delay			30.4			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			84.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

59: Flower St & Beale Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	128	49	89	121	232	31	195	118	126	822	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.90		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1786		1770	1679		1770	3339		1770	3451	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1786		1770	1679		1770	3339		1770	3451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	139	53	97	132	252	34	212	128	137	893	178
RTOR Reduction (vph)	0	18	0	0	82	0	0	88	0	0	19	0
Lane Group Flow (vph)	8	174	0	97	302	0	34	252	0	137	1052	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.0	14.7		5.8	19.5		2.4	19.8		7.5	24.9	
Effective Green, g (s)	1.0	14.7		5.8	19.5		2.4	19.8		7.5	24.9	
Actuated g/C Ratio	0.02	0.23		0.09	0.31		0.04	0.31		0.12	0.39	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	28	412		161	513		67	1036		208	1347	
v/s Ratio Prot	0.00	0.10		c0.05	c0.18		0.02	0.08		c0.08	c0.30	
v/s Ratio Perm												
v/c Ratio	0.29	0.42		0.60	0.59		0.51	0.24		0.66	0.78	
Uniform Delay, d1	31.0	20.9		27.9	18.8		30.1	16.4		26.9	17.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	0.7		6.2	1.7		5.9	0.1		7.3	3.0	
Delay (s)	36.6	21.6		34.1	20.5		36.1	16.5		34.3	20.1	
Level of Service	D	C		C	C		D	B		C	C	
Approach Delay (s)		22.2			23.2			18.3			21.7	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			21.5			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			63.8			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			68.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

59: Flower St & Beale Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	289	33	138	148	286	51	343	438	189	463	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flt	1.00	0.98		1.00	0.90		1.00	0.92		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1834		1770	1679		1770	3242		1770	3471	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1834		1770	1679		1770	3242		1770	3471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	314	36	150	161	311	55	373	476	205	503	74
RTOR Reduction (vph)	0	6	0	0	82	0	0	309	0	0	14	0
Lane Group Flow (vph)	15	344	0	150	390	0	55	540	0	205	563	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.3	20.4		8.1	27.2		4.3	17.4		10.6	23.7	
Effective Green, g (s)	1.3	20.4		8.1	27.2		4.3	17.4		10.6	23.7	
Actuated g/C Ratio	0.02	0.28		0.11	0.38		0.06	0.24		0.15	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	32	516		198	630		105	778		259	1135	
v/s Ratio Prot	0.01	0.19		c0.08	c0.23		0.03	c0.17		c0.12	0.16	
v/s Ratio Perm												
v/c Ratio	0.47	0.67		0.76	0.62		0.52	0.69		0.79	0.50	
Uniform Delay, d1	35.3	23.0		31.2	18.4		33.1	25.1		29.9	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.5	3.3		15.2	1.8		4.7	2.7		15.1	0.3	
Delay (s)	45.7	26.3		46.5	20.3		37.8	27.8		45.0	19.9	
Level of Service	D	C		D	C		D	C		D	B	
Approach Delay (s)		27.1			26.6			28.4			26.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			27.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			72.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			76.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

60: F ST & Golden State Ave























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	160	11	66	43	14	34	33	2540	571	147	3401	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1696	1583		1728		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1696	1583		1728		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	12	72	47	15	37	36	2761	621	160	3697	32
RTOR Reduction (vph)	0	0	68	0	16	0	0	0	100	0	0	2
Lane Group Flow (vph)	92	94	4	0	83	0	36	2761	521	160	3697	30
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7						6			2
Actuated Green, G (s)	8.0	8.0	8.0		12.2		5.9	90.4	90.4	10.3	94.8	94.8
Effective Green, g (s)	8.0	8.0	8.0		12.2		5.9	90.4	90.4	10.3	94.8	94.8
Actuated g/C Ratio	0.06	0.06	0.06		0.09		0.04	0.64	0.64	0.07	0.67	0.67
Clearance Time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Vehicle Extension (s)	4.5	4.5	4.5		3.0		2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	95	96	90		150		74	2269	1015	129	2379	1064
v/s Ratio Prot	0.05	c0.06			c0.05		0.02	0.78		c0.09	c1.04	
v/s Ratio Perm			0.00						0.33			0.02
v/c Ratio	0.97	0.98	0.05		0.56		0.49	1.22	0.51	1.24	1.55	0.03
Uniform Delay, d1	66.4	66.4	62.9		61.8		66.1	25.3	13.5	65.4	23.1	7.7
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.8	84.7	0.4		4.4		1.8	101.8	0.8	157.6	251.4	0.0
Delay (s)	148.2	151.1	63.2		66.2		67.9	127.1	14.4	222.9	274.5	7.7
Level of Service	F	F	E		E		E	F	B	F	F	A
Approach Delay (s)		125.6			66.2			106.0			270.2	
Approach LOS		F			E			F			F	
Intersection Summary												
HCM Average Control Delay		189.5			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.36										
Actuated Cycle Length (s)		141.0			Sum of lost time (s)			14.8				
Intersection Capacity Utilization		123.3%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

60: F ST & Golden State Ave

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	511	20	136	87	23	31	17	3901	308	321	3920	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85		0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1691	1583		1753		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.96	1.00		0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1691	1583		1753		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	555	22	148	95	25	34	18	4240	335	349	4261	12
RTOR Reduction (vph)	0	0	132	0	7	0	0	0	38	0	0	0
Lane Group Flow (vph)	289	288	16	0	147	0	18	4240	297	349	4261	12
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		1	6		5	2	
Permitted Phases			7						6			2
Actuated Green, G (s)	15.5	15.5	15.5		16.9		4.1	76.7	76.7	17.3	89.9	89.9
Effective Green, g (s)	15.5	15.5	15.5		16.9		4.1	76.7	76.7	17.3	89.9	89.9
Actuated g/C Ratio	0.11	0.11	0.11		0.12		0.03	0.52	0.52	0.12	0.61	0.61
Clearance Time (s)	5.5	5.5	5.5		5.6		3.7	5.3	5.3	3.7	5.3	5.3
Vehicle Extension (s)	4.5	4.5	4.5		3.0		2.0	4.9	4.9	2.0	4.9	4.9
Lane Grp Cap (vph)	178	179	167		202		50	1853	829	209	2172	971
v/s Ratio Prot	c0.17	0.17			c0.08		0.01	c1.20		c0.20	c1.20	
v/s Ratio Perm			0.01						0.19			0.01
v/c Ratio	1.62	1.61	0.09		0.73		0.36	2.29	0.36	1.67	1.96	0.01
Uniform Delay, d1	65.5	65.5	59.2		62.6		69.9	34.9	20.5	64.6	28.3	11.0
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	304.9	298.4	0.4		12.3		1.6	581.4	0.5	321.6	434.5	0.0
Delay (s)	370.4	363.9	59.6		74.8		71.5	616.3	21.0	386.2	462.8	11.0
Level of Service	F	F	E		E		E	F	C	F	F	B
Approach Delay (s)		304.4			74.8			570.7			455.8	
Approach LOS		F			E			F			F	
Intersection Summary												
HCM Average Control Delay		491.4					HCM Level of Service		F			
HCM Volume to Capacity ratio		2.01										
Actuated Cycle Length (s)		146.5					Sum of lost time (s)		25.4			
Intersection Capacity Utilization		159.0%					ICU Level of Service		H			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

61: Jefferson St & Beale Ave

















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	189	0	142	0	271	0	0	466	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	205	0	154	0	295	0	0	507	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								857				
pX, platoon unblocked												
vC, conflicting volume	808	801	253	548	801	147	507			295		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	808	801	253	548	801	147	507			295		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	51	100	82	100			100		
cM capacity (veh/h)	224	316	746	419	316	873	1054			1264		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total	137	223	147	147	338	169						
Volume Left	137	68	0	0	0	0						
Volume Right	0	154	0	0	0	0						
cSH	419	655	1700	1700	1700	1700						
Volume to Capacity	0.33	0.34	0.09	0.09	0.20	0.10						
Queue Length 95th (ft)	35	38	0	0	0	0						
Control Delay (s)	17.7	13.3	0.0	0.0	0.0	0.0						
Lane LOS	C	B										
Approach Delay (s)	15.0		0.0		0.0							
Approach LOS	B											
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			29.1%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

61: Jefferson St & Beale Ave






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	111	19	42	0	510	0	0	522	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	121	21	46	0	554	0	0	567	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								857				
pX, platoon unblocked												
vC, conflicting volume	923	1144	306	838	1166	277	612			554		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	923	1144	306	838	1166	277	612			554		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	53	89	94	100			100		
cM capacity (veh/h)	193	198	690	259	193	720	963			1012		
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total	80	107	277	277	378	234						
Volume Left	80	40	0	0	0	0						
Volume Right	0	46	0	0	0	45						
cSH	259	327	1700	1700	1700	1700						
Volume to Capacity	0.31	0.33	0.16	0.16	0.22	0.14						
Queue Length 95th (ft)	32	35	0	0	0	0						
Control Delay (s)	25.0	21.3	0.0	0.0	0.0	0.0						
Lane LOS	D	C										
Approach Delay (s)	22.9		0.0		0.0							
Approach LOS	C											
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			27.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

62: Parking Lot & Chester Ave






















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	9	304	1	39	31	511	481	100	727	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Flt		0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1634		1681	1686	1583	1770	3539	1583	1770	3538	
Flt Permitted		1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1634		1681	1686	1583	1770	3539	1583	1770	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	10	330	1	42	34	555	523	109	790	2
RTOR Reduction (vph)	0	10	0	0	0	34	0	0	355	0	0	0
Lane Group Flow (vph)	0	1	0	165	166	8	34	555	168	109	792	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			
Actuated Green, G (s)		0.8		9.5	9.5	9.5	1.8	16.1	16.1	5.2	19.5	
Effective Green, g (s)		0.8		9.5	9.5	9.5	1.8	16.1	16.1	5.2	19.5	
Actuated g/C Ratio		0.02		0.19	0.19	0.19	0.04	0.32	0.32	0.10	0.39	
Clearance Time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)		2.0		1.5	1.5	1.5	1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)		26		319	320	300	64	1137	509	184	1377	
v/s Ratio Prot		c0.00		0.10	c0.10		0.02	0.16		c0.06	c0.22	
v/s Ratio Perm						0.01			0.11			
v/c Ratio		0.04		0.52	0.52	0.03	0.53	0.49	0.33	0.59	0.58	
Uniform Delay, d1		24.3		18.2	18.2	16.5	23.7	13.7	12.9	21.4	12.0	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		0.6	0.6	0.0	4.2	0.1	0.1	3.4	0.4	
Delay (s)		24.5		18.8	18.8	16.5	27.9	13.8	13.0	24.8	12.4	
Level of Service		C		B	B	B	C	B	B	C	B	
Approach Delay (s)		24.5			18.6			13.9			13.9	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM Average Control Delay			14.7			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			50.1			Sum of lost time (s)			18.5			
Intersection Capacity Utilization			50.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

62: Parking Lot & Chester Ave

























10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	8	26	528	4	69	21	917	234	65	792	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Flt		0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1689		1681	1686	1583	1770	3539	1583	1770	3537	
Flt Permitted		0.99		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1689		1681	1686	1583	1770	3539	1583	1770	3537	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	9	28	574	4	75	23	997	254	71	861	4
RTOR Reduction (vph)	0	27	0	0	0	63	0	0	133	0	1	0
Lane Group Flow (vph)	0	17	0	287	291	12	23	997	121	71	864	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			
Actuated Green, G (s)		3.1		9.9	9.9	9.9	1.0	25.5	25.5	3.6	28.1	
Effective Green, g (s)		3.1		9.9	9.9	9.9	1.0	25.5	25.5	3.6	28.1	
Actuated g/C Ratio		0.05		0.16	0.16	0.16	0.02	0.42	0.42	0.06	0.46	
Clearance Time (s)		5.0		4.5	4.5	4.5	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)		2.0		1.5	1.5	1.5	1.0	2.0	2.0	1.0	2.0	
Lane Grp Cap (vph)		86		275	275	259	29	1489	666	105	1640	
v/s Ratio Prot		c0.01		0.17	c0.17		0.01	c0.28		c0.04	c0.24	
v/s Ratio Perm						0.01			0.08			
v/c Ratio		0.20		1.04	1.06	0.05	0.79	0.67	0.18	0.68	0.53	
Uniform Delay, d1		27.6		25.3	25.3	21.4	29.7	14.2	11.0	27.9	11.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4		66.1	70.4	0.0	79.5	0.9	0.0	12.7	0.1	
Delay (s)		28.0		91.5	95.8	21.4	109.2	15.0	11.1	40.6	11.7	
Level of Service		C		F	F	C	F	B	B	D	B	
Approach Delay (s)		28.0			85.3			16.0			13.9	
Approach LOS		C			F			B			B	
Intersection Summary												
HCM Average Control Delay			31.1			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			60.6			Sum of lost time (s)			23.5			
Intersection Capacity Utilization			61.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

63: 34th ST & Union Ave

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	109	108	270	155	183	355	668	101	166	744	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4985		1770	5035	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4985		1770	5035	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	118	117	293	168	199	386	726	110	180	809	57
RTOR Reduction (vph)	0	0	92	0	0	137	0	22	0	0	9	0
Lane Group Flow (vph)	40	118	25	293	168	62	386	814	0	180	857	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.3	18.6	18.6	12.0	26.9	26.9	16.0	27.0		11.2	22.2	
Effective Green, g (s)	4.3	18.6	18.6	12.0	26.9	26.9	16.0	27.0		11.2	22.2	
Actuated g/C Ratio	0.05	0.22	0.22	0.14	0.31	0.31	0.19	0.31		0.13	0.26	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	2.5	2.5	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	89	765	342	247	1107	495	329	1565		231	1300	
v/s Ratio Prot	0.02	0.03		c0.17	c0.05		c0.22	0.16		0.10	c0.17	
v/s Ratio Perm			0.02			0.04						
v/c Ratio	0.45	0.15	0.07	1.19	0.15	0.13	1.17	0.52		0.78	0.66	
Uniform Delay, d1	39.7	27.3	26.8	37.0	21.3	21.1	35.0	24.2		36.2	28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.2	0.2	117.0	0.0	0.1	105.4	0.6		14.0	1.6	
Delay (s)	41.0	27.5	27.0	154.0	21.4	21.2	140.4	24.8		50.2	30.2	
Level of Service	D	C	C	F	C	C	F	C		D	C	
Approach Delay (s)		29.3			80.2			61.3			33.6	
Approach LOS		C			F			E			C	

























Intersection Summary

HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

63: 34th ST & Union Ave















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	239	257	295	125	162	149	703	223	312	883	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	4902		1770	5061	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	4902		1770	5061	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	260	279	321	136	176	162	764	242	339	960	32
RTOR Reduction (vph)	0	0	218	0	0	124	0	63	0	0	4	0
Lane Group Flow (vph)	97	260	61	321	136	52	162	943	0	339	988	0
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.2	19.0	19.0	13.0	25.4	25.4	10.3	23.6		14.0	27.3	
Effective Green, g (s)	7.2	19.0	19.0	13.0	25.4	25.4	10.3	23.6		14.0	27.3	
Actuated g/C Ratio	0.08	0.22	0.22	0.15	0.29	0.29	0.12	0.27		0.16	0.31	
Clearance Time (s)	4.0	4.6	4.6	4.0	4.0	4.0	4.0	4.6		4.0	4.6	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	2.5	2.5	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	147	775	347	265	1036	463	210	1333		285	1592	
v/s Ratio Prot	0.05	c0.07		c0.18	0.04		0.09	c0.19		c0.19	c0.20	
v/s Ratio Perm			0.04			0.03						
v/c Ratio	0.66	0.34	0.18	1.21	0.13	0.11	0.77	0.71		1.19	0.62	
Uniform Delay, d1	38.6	28.6	27.5	36.9	22.6	22.4	37.1	28.5		36.4	25.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.9	0.5	0.5	124.8	0.0	0.1	14.7	2.2		114.7	1.1	
Delay (s)	46.5	29.1	28.0	161.7	22.6	22.5	51.8	30.7		151.1	26.4	
Level of Service	D	C	C	F	C	C	D	C		F	C	
Approach Delay (s)		31.3			93.1			33.6			58.2	
Approach LOS		C			F			C			E	
Intersection Summary												
HCM Average Control Delay			51.9				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			86.8				Sum of lost time (s)			21.8		
Intersection Capacity Utilization			80.7%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

64: Columbus St & Chester Ave














10/12/2010

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	242	310	0	271	146	321	574
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0	4.0
Lane Util. Factor	0.97	0.91		0.95		1.00	0.95
Fr _t	0.95	0.85		0.95		1.00	1.00
Flt Protected	0.97	1.00		1.00		0.95	1.00
Satd. Flow (prot)	3313	1441		3353		1770	3539
Flt Permitted	0.97	1.00		1.00		0.49	1.00
Satd. Flow (perm)	3313	1441		3353		913	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	337	0	295	159	349	624
RTOR Reduction (vph)	113	145	0	69	0	0	0
Lane Group Flow (vph)	298	44	0	385	0	349	624
Turn Type	Perm		Perm		Perm		
Protected Phases	8			2			6
Permitted Phases		8	2			6	
Actuated Green, G (s)	9.4	9.4		22.6		22.6	22.6
Effective Green, g (s)	9.4	9.4		22.6		22.6	22.6
Actuated g/C Ratio	0.24	0.24		0.57		0.57	0.57
Clearance Time (s)	4.0	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	779	339		1894		516	2000
v/s Ratio Prot	c0.09			0.11			0.18
v/s Ratio Perm		0.03				c0.38	
v/c Ratio	0.38	0.13		0.20		0.68	0.31
Uniform Delay, d1	12.9	12.1		4.3		6.1	4.6
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.3	0.2		0.1		3.5	0.1
Delay (s)	13.2	12.3		4.3		9.6	4.7
Level of Service	B	B		A		A	A
Approach Delay (s)	12.9			4.3			6.5
Approach LOS	B			A			A
Intersection Summary							
HCM Average Control Delay			7.9		HCM Level of Service		A
HCM Volume to Capacity ratio			0.59				
Actuated Cycle Length (s)			40.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization			50.1%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

64: Columbus St & Chester Ave






















10/12/2010

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	146	350	0	739	180	539	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0	4.0
Lane Util. Factor	0.97	0.91		0.95		1.00	0.95
Flt	0.92	0.85		0.97		1.00	1.00
Flt Protected	0.98	1.00		1.00		0.95	1.00
Satd. Flow (prot)	3245	1441		3435		1770	3539
Flt Permitted	0.98	1.00		1.00		0.28	1.00
Satd. Flow (perm)	3245	1441		3435		513	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	380	0	803	196	586	636
RTOR Reduction (vph)	155	172	0	11	0	0	0
Lane Group Flow (vph)	194	18	0	988	0	586	636
Turn Type		Perm	Perm			Perm	
Protected Phases	8			2			6
Permitted Phases		8	2			6	
Actuated Green, G (s)	13.6	13.6		120.1		120.1	120.1
Effective Green, g (s)	13.6	13.6		120.1		120.1	120.1
Actuated g/C Ratio	0.10	0.10		0.85		0.85	0.85
Clearance Time (s)	4.0	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	311	138		2911		435	3000
v/s Ratio Prot	c0.06			0.29			0.18
v/s Ratio Perm		0.01				c1.14	
v/c Ratio	0.62	0.13		0.34		1.35	0.21
Uniform Delay, d1	61.6	58.6		2.3		10.8	2.0
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.8	0.4		0.1		170.9	0.0
Delay (s)	65.4	59.1		2.4		181.7	2.0
Level of Service	E	E		A		F	A
Approach Delay (s)	63.2			2.4			88.2
Approach LOS	E			A			F
Intersection Summary							
HCM Average Control Delay			52.2		HCM Level of Service		D
HCM Volume to Capacity ratio			1.27				
Actuated Cycle Length (s)			141.7		Sum of lost time (s)		8.0
Intersection Capacity Utilization			73.9%		ICU Level of Service		D
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

65: Columbus Street & Union Ave





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	158	66	275	322	240	103	499	127	259	551	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frt	1.00	0.96		1.00	0.94		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3383		1770	3312		1770	4930		1770	4945	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3383		1770	3312		1770	4930		1770	4945	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	149	172	72	299	350	261	112	542	138	282	599	135
RTOR Reduction (vph)	0	50	0	0	142	0	0	46	0	0	35	0
Lane Group Flow (vph)	149	194	0	299	469	0	112	634	0	282	699	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.9	14.2		14.2	17.5		8.4	17.8		14.2	23.6	
Effective Green, g (s)	10.9	14.2		14.2	17.5		8.4	17.8		14.2	23.6	
Actuated g/C Ratio	0.14	0.19		0.19	0.23		0.11	0.23		0.19	0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	253	629		329	759		195	1149		329	1528	
v/s Ratio Prot	0.08	0.06		c0.17	c0.14		0.06	c0.13		c0.16	0.14	
v/s Ratio Perm												
v/c Ratio	0.59	0.31		0.91	0.62		0.57	0.55		0.86	0.46	
Uniform Delay, d1	30.7	26.9		30.5	26.4		32.3	25.8		30.1	21.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	0.3		27.4	1.5		4.0	0.6		19.2	0.2	
Delay (s)	34.1	27.1		57.9	28.0		36.4	26.4		49.3	21.5	
Level of Service	C	C		E	C		D	C		D	C	
Approach Delay (s)		29.8			37.8			27.8			29.2	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		31.4					HCM Level of Service		C			
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		76.4					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		64.3%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis













65: Columbus Street & Union Ave

10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	469	115	239	271	252	121	670	223	649	720	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Flt	1.00	0.97		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3435		1770	3284		1770	4895		1770	5009	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3435		1770	3284		1770	4895		1770	5009	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	510	125	260	295	274	132	728	242	705	783	87
RTOR Reduction (vph)	0	15	0	0	115	0	0	42	0	0	9	0
Lane Group Flow (vph)	158	620	0	260	454	0	132	928	0	705	861	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.3	29.0		18.0	31.7		15.1	30.4		50.0	65.3	
Effective Green, g (s)	15.3	29.0		18.0	31.7		15.1	30.4		50.0	65.3	
Actuated g/C Ratio	0.11	0.20		0.13	0.22		0.11	0.21		0.35	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	189	695		222	726		186	1038		617	2281	
v/s Ratio Prot	0.09	c0.18		c0.15	c0.14		0.07	c0.19		c0.40	0.17	
v/s Ratio Perm												
v/c Ratio	0.84	0.89		1.17	0.62		0.71	0.89		1.14	0.38	
Uniform Delay, d1	62.8	55.7		62.7	50.5		62.0	54.9		46.7	25.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.1	13.7		114.4	1.7		11.7	10.0		82.4	0.1	
Delay (s)	88.9	69.4		177.1	52.2		73.8	64.9		129.1	25.8	
Level of Service	F	E		F	D		E	E		F	C	
Approach Delay (s)		73.3			91.3			66.0			72.0	
Approach LOS		E			F			E			E	
Intersection Summary												
HCM Average Control Delay		74.4					HCM Level of Service		E			
HCM Volume to Capacity ratio		1.05										
Actuated Cycle Length (s)		143.4					Sum of lost time (s)		20.0			
Intersection Capacity Utilization		97.1%					ICU Level of Service		F			
Analysis Period (min)		15										
c Critical Lane Group												













HCM Unsignalized Intersection Capacity Analysis 66: 30Th St & Chester Ave

10/12/2010

												
Movement	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL
Right Turn Channelized												
Volume (veh/h)	18	97	90	42	23	46	21	78	58	82	46	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	105	98	46	25	50	23	85	63	89	50	61
Approach Volume (veh/h)			293					310				
Crossing Volume (veh/h)			1103					1041				
High Capacity (veh/h)			572					602				
High v/c (veh/h)			0.51					0.51				
Low Capacity (veh/h)			439					465				
Low v/c (veh/h)			0.67					0.67				

Intersection Summary

Maximum v/c High	1.00
Maximum v/c Low	1.22
Intersection Capacity Utilization	122.9%
ICU Level of Service	H

												
Movement	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	SEL2	SEL	SET	SER
Right Turn Channelized												
Volume (veh/h)	441	67	7	2	55	433	266	209	300	47	8	103
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	479	73	8	2	60	471	289	227	326	51	9	112
Approach Volume (veh/h)	671					1049					502	
Crossing Volume (veh/h)	766					351					1029	
High Capacity (veh/h)	753					1051					608	
High v/c (veh/h)	0.89					1.00					0.83	
Low Capacity (veh/h)	596					859					470	
Low v/c (veh/h)	1.13					1.22					1.07	













Intersection Summary













	
Movement	SER2
Right Turn Channelized	
Volume (veh/h)	4
Peak Hour Factor	0.92
Hourly flow rate (vph)	4
Approach Volume (veh/h)	
Crossing Volume (veh/h)	
High Capacity (veh/h)	
High v/c (veh/h)	
Low Capacity (veh/h)	
Low v/c (veh/h)	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis 66: 30Th St & Chester Ave

10/12/2010

												
Movement	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2	NBL2	NBL
Right Turn Channelized												
Volume (veh/h)	83	248	112	84	45	53	39	115	57	110	100	162
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	270	122	91	49	58	42	125	62	120	109	176
Approach Volume (veh/h)			622					407				
Crossing Volume (veh/h)			1209#					1592#				
High Capacity (veh/h)			524					380				
High v/c (veh/h)			1.19					1.07				
Low Capacity (veh/h)			399					279				
Low v/c (veh/h)			1.56					1.46				
Intersection Summary												
Maximum v/c High			1.69									
Maximum v/c Low			2.17									
Intersection Capacity Utilization			Err%			ICU Level of Service				H		
# Crossing flow exceeds 1200, method is not applicable												





















												
Movement	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	SEL2	SEL	SET	SER
Right Turn Channelized												
Volume (veh/h)	655	60	15	6	63	559	253	311	217	22	3	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	712	65	16	7	68	608	275	338	236	24	3	163
Approach Volume (veh/h)	1078					1296					601	
Crossing Volume (veh/h)	968					662					1291#	
High Capacity (veh/h)	639					820					489	
High v/c (veh/h)	1.69					1.58					1.23	
Low Capacity (veh/h)	497					654					370	
Low v/c (veh/h)	2.17					1.98					1.63	
Intersection Summary												

	
Movement	SER2
Right Turn Channelized	
Volume (veh/h)	161
Peak Hour Factor	0.92
Hourly flow rate (vph)	175
Approach Volume (veh/h)	
Crossing Volume (veh/h)	
High Capacity (veh/h)	
High v/c (veh/h)	
Low Capacity (veh/h)	
Low v/c (veh/h)	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

67: California Ave & L St





















10/12/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	777	11	19	457	19	7	8	3	10	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5075		1770	5054		1770	1793		1770	1701	
Flt Permitted	0.45	1.00		0.33	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)	839	5075		606	5054		1863	1793		1863	1701	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	845	12	21	497	21	8	9	3	11	16	22
RTOR Reduction (vph)	0	2	0	0	7	0	0	3	0	0	20	0
Lane Group Flow (vph)	36	855	0	21	511	0	8	9	0	11	18	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	4			8			2			6		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.3	12.3		12.3	12.3		1.7	1.7		1.7	1.7	
Effective Green, g (s)	12.3	12.3		12.3	12.3		1.7	1.7		1.7	1.7	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.08	0.08		0.08	0.08	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	469	2837		339	2826		144	139		144	131	
v/s Ratio Prot		c0.17			0.10			0.01			c0.01	
v/s Ratio Perm	0.04			0.03			0.00			0.01		
v/c Ratio	0.08	0.30		0.06	0.18		0.06	0.07		0.08	0.14	
Uniform Delay, d1	2.2	2.6		2.2	2.4		9.4	9.4		9.4	9.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.0		0.2	0.2		0.2	0.5	
Delay (s)	2.3	2.6		2.3	2.4		9.6	9.6		9.6	9.9	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		2.6			2.4			9.6			9.9	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay	2.9			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.28											
Actuated Cycle Length (s)	22.0			Sum of lost time (s)			8.0					
Intersection Capacity Utilization	35.8%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

67: California Ave & L St

10/12/2010

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	846	239	200	1074	14	99	619	211	11	550	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Flt	1.00	0.97		1.00	1.00		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4917		1770	5076		1770	1792		1770	1848	
Flt Permitted	0.22	1.00		0.22	1.00		0.21	1.00		0.21	1.00	
Satd. Flow (perm)	414	4917		414	5076		392	1792		392	1848	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	920	260	217	1167	15	108	673	229	12	598	33
RTOR Reduction (vph)	0	102	0	0	3	0	0	27	0	0	5	0
Lane Group Flow (vph)	67	1078	0	217	1179	0	108	875	0	12	626	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	4			8			2			6		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.0	18.0		18.0	18.0		19.0	19.0		19.0	19.0	
Effective Green, g (s)	18.0	18.0		18.0	18.0		19.0	19.0		19.0	19.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	166	1967		166	2030		166	757		166	780	
v/s Ratio Prot		0.22			0.23			0.49			0.34	
v/s Ratio Perm	0.16			0.52			0.28			0.03		
v/c Ratio	0.40	0.55		1.31	0.58		0.65	1.16		0.07	0.80	
Uniform Delay, d1	9.7	10.4		13.5	10.6		10.4	13.0		7.7	11.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.3		174.8	0.4		8.8	84.7		0.2	6.0	
Delay (s)	11.3	10.7		188.3	11.0		19.2	97.7		7.9	17.4	
Level of Service	B	B		F	B		B	F		A	B	
Approach Delay (s)		10.7			38.5			89.3			17.2	
Approach LOS		B			D			F			B	
Intersection Summary												
HCM Average Control Delay	39.2			HCM Level of Service			D					
HCM Volume to Capacity ratio	1.23											
Actuated Cycle Length (s)	45.0			Sum of lost time (s)			8.0					
Intersection Capacity Utilization	94.8%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

**FRESNO HEAVY MAINTENANCE
NO-BUILD CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: E Central Ave & Cedar Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	121	13	66	226	46	3	160	29	33	182	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	132	14	72	246	50	34	174	32	36	198	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	146	367	239	234								
Volume Left (vph)	0	72	34	36								
Volume Right (vph)	14	50	32	0								
Hadj (s)	-0.02	-0.01	-0.02	0.06								
Departure Headway (s)	6.0	5.6	5.9	5.9								
Degree Utilization, x	0.24	0.57	0.39	0.39								
Capacity (veh/h)	525	606	555	550								
Control Delay (s)	10.9	15.8	12.5	12.6								
Approach Delay (s)	10.9	15.8	12.5	12.6								
Approach LOS	B	C	B	B								
Intersection Summary												
Delay			13.5									
HCM Level of Service			B									
Intersection Capacity Utilization			51.2%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: E Central Ave & Cedar Ave







4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	92	234	56	106	368	93	25	222	39	36	268	95
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	254	61	115	400	101	27	241	42	39	291	103
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	415	616	311	434								
Volume Left (vph)	100	115	27	39								
Volume Right (vph)	61	101	42	103								
Hadj (s)	-0.01	-0.03	-0.03	-0.09								
Departure Headway (s)	9.1	9.1	9.5	9.0								
Degree Utilization, x	1.05	1.56	0.82	1.09								
Capacity (veh/h)	401	400	373	394								
Control Delay (s)	89.9	285.2	44.3	100.7								
Approach Delay (s)	89.9	285.2	44.3	100.7								
Approach LOS	F	F	E	F								
Intersection Summary												
Delay			152.3									
HCM Level of Service			F									
Intersection Capacity Utilization			73.9%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: E Central Ave & SR 99 SB offramp







4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Volume (veh/h)	0	430	376	0	432	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	467	409	0	470	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	409				876	409
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	409				876	409
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	74
cM capacity (veh/h)	1150				319	643
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	467	409	638			
Volume Left	0	0	470			
Volume Right	0	0	168			
cSH	1700	1700	368			
Volume to Capacity	0.27	0.24	1.73			
Queue Length 95th (ft)	0	0	994			
Control Delay (s)	0.0	0.0	366.2			
Lane LOS			F			
Approach Delay (s)	0.0	0.0	366.2			
Approach LOS			F			
Intersection Summary						
Average Delay			154.3			
Intersection Capacity Utilization			62.7%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis









2: E Central Ave & SR 99 SB offramp

4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Volume (veh/h)	0	498	435	0	317	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	541	473	0	345	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	473				1014	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	473				1014	473
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	72
cM capacity (veh/h)	1089				264	591
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	541	473	513			
Volume Left	0	0	345			
Volume Right	0	0	168			
cSH	1700	1700	323			
Volume to Capacity	0.32	0.28	1.59			
Queue Length 95th (ft)	0	0	754			
Control Delay (s)	0.0	0.0	308.2			
Lane LOS			F			
Approach Delay (s)	0.0	0.0	308.2			
Approach LOS			F			
Intersection Summary						
Average Delay			103.5			
Intersection Capacity Utilization			59.9%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 3: E Central Ave & SR 99 NB onramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	60	722	372	309	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	785	404	336	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	404				1488	572
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404				1488	572
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	100
cM capacity (veh/h)	1154				129	519
Direction, Lane #	EB 1	WB 1				
Volume Total	850	740				
Volume Left	65	0				
Volume Right	0	336				
cSH	1154	1700				
Volume to Capacity	0.06	0.44				
Queue Length 95th (ft)	4	0				
Control Delay (s)	1.4	0.0				
Lane LOS	A					
Approach Delay (s)	1.4	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			86.4%	ICU Level of Service	E	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis










3: E Central Ave & SR 99 NB onramp

4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	157	620	376	618	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	674	409	672	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	409				1760	745
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	409				1760	745
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				100	100
cM capacity (veh/h)	1150				79	414
Direction, Lane #	EB 1	WB 1				
Volume Total	845	1080				
Volume Left	171	0				
Volume Right	0	672				
cSH	1150	1700				
Volume to Capacity	0.15	0.64				
Queue Length 95th (ft)	13	0				
Control Delay (s)	3.5	0.0				
Lane LOS	A					
Approach Delay (s)	3.5	0.0				
Approach LOS						
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		105.7%		ICU Level of Service		G
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis 4: S.Chestnut Ave & SR 99 NB off ramp










4/25/2011

						
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	330	0	0	755	156	628
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	359	0	0	821	170	683
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			359		1179	359
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			359		1179	359
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		19	0
cM capacity (veh/h)			1200		210	686
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	359	821	852			
Volume Left	0	0	170			
Volume Right	0	0	683			
cSH	1700	1700	473			
Volume to Capacity	0.21	0.48	1.80			
Queue Length 95th (ft)	0	0	1334			
Control Delay (s)	0.0	0.0	389.6			
Lane LOS			F			
Approach Delay (s)	0.0	0.0	389.6			
Approach LOS			F			
Intersection Summary						
Average Delay			163.4			
Intersection Capacity Utilization			93.8%	ICU Level of Service		F
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: S. Chestnut Ave & SR 99 NB off ramp









4/25/2011

						
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Volume (veh/h)	516	0	0	924	32	497
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	561	0	0	1004	35	540
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			561		1565	561
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			561		1565	561
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		72	0
cM capacity (veh/h)			1010		123	527
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	561	1004	575			
Volume Left	0	0	35			
Volume Right	0	0	540			
cSH	1700	1700	439			
Volume to Capacity	0.33	0.59	1.31			
Queue Length 95th (ft)	0	0	636			
Control Delay (s)	0.0	0.0	180.8			
Lane LOS			F			
Approach Delay (s)	0.0	0.0	180.8			
Approach LOS			F			
Intersection Summary						
Average Delay			48.6			
Intersection Capacity Utilization			87.8%	ICU Level of Service		E
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis









5: SR 99 SB on ramp & S.Chestnut Ave

4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	345	27	361	340
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	375	29	392	370
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1544	390			404	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1544	390			404	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			66	
cM capacity (veh/h)	83	659			1154	
Direction, Lane #	NB 1	SB 1				
Volume Total	404	762				
Volume Left	0	392				
Volume Right	29	0				
cSH	1700	1154				
Volume to Capacity	0.24	0.34				
Queue Length 95th (ft)	0	38				
Control Delay (s)	0.0	7.1				
Lane LOS		A				
Approach Delay (s)	0.0	7.1				
Approach LOS						
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization			64.3%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 5: SR 99 SB on ramp & S. Chestnut Ave











4/25/2011

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	492	65	577	299
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	535	71	627	325
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2149	570			605	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2149	570			605	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			36	
cM capacity (veh/h)	19	521			973	
Direction, Lane #	NB 1	SB 1				
Volume Total	605	952				
Volume Left	0	627				
Volume Right	71	0				
cSH	1700	973				
Volume to Capacity	0.36	0.64				
Queue Length 95th (ft)	0	122				
Control Delay (s)	0.0	14.1				
Lane LOS		B				
Approach Delay (s)	0.0	14.1				
Approach LOS						
Intersection Summary						
Average Delay			8.6			
Intersection Capacity Utilization			84.2%	ICU Level of Service	E	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: E American Avenue & SR 99 SB off ramp







4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	280	442	0	108	144
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	304	480	0	117	157
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	480				785	480
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480				785	480
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				68	73
cM capacity (veh/h)	1082				362	586
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	304	480	117	157		
Volume Left	0	0	117	0		
Volume Right	0	0	0	157		
cSH	1700	1700	362	586		
Volume to Capacity	0.18	0.28	0.32	0.27		
Queue Length 95th (ft)	0	0	35	27		
Control Delay (s)	0.0	0.0	19.7	13.4		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	16.1			
Approach LOS			C			
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			38.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: E American Avenue & SR 99 SB off ramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Volume (veh/h)	0	496	537	0	325	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	539	584	0	353	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	584				1123	584
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	584				1123	584
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				0	91
cM capacity (veh/h)	991				228	512
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	539	584	353	45		
Volume Left	0	0	353	0		
Volume Right	0	0	0	45		
cSH	1700	1700	228	512		
Volume to Capacity	0.32	0.34	1.55	0.09		
Queue Length 95th (ft)	0	0	545	7		
Control Delay (s)	0.0	0.0	307.9	12.7		
Lane LOS			F	B		
Approach Delay (s)	0.0	0.0	274.8			
Approach LOS			F			
Intersection Summary						
Average Delay			71.9			
Intersection Capacity Utilization			52.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: E American Ave & SR 99 NB on ramp









4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	43	346	443	140	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	376	482	152	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	482				1027	558
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	482				1027	558
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	100
cM capacity (veh/h)	1081				248	529
Direction, Lane #	EB 1	WB 1				
Volume Total	423	634				
Volume Left	47	0				
Volume Right	0	152				
cSH	1081	1700				
Volume to Capacity	0.04	0.37				
Queue Length 95th (ft)	3	0				
Control Delay (s)	1.4	0.0				
Lane LOS	A					
Approach Delay (s)	1.4	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			57.6%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: E American Ave & SR 99 NB on ramp

















4/25/2011

						
Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	111	797	533	105	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	866	579	114	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	579				1744	636
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	579				1744	636
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				100	100
cM capacity (veh/h)	994				84	478
Direction, Lane #	EB 1	WB 1				
Volume Total	987	693				
Volume Left	121	0				
Volume Right	0	114				
cSH	994	1700				
Volume to Capacity	0.12	0.41				
Queue Length 95th (ft)	10	0				
Control Delay (s)	3.1	0.0				
Lane LOS	A					
Approach Delay (s)	3.1	0.0				
Approach LOS						
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			89.2%	ICU Level of Service	E	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Adams Ave & Chestnut Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	16	100	4	13	148	22	7	62	10	8	53	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	109	4	14	161	24	8	67	11	9	58	25
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	130	199	86	91								
Volume Left (vph)	17	14	8	9								
Volume Right (vph)	4	24	11	25								
Hadj (s)	0.04	-0.02	-0.02	-0.11								
Departure Headway (s)	4.6	4.5	4.8	4.7								
Degree Utilization, x	0.17	0.25	0.11	0.12								
Capacity (veh/h)	743	764	699	708								
Control Delay (s)	8.5	8.9	8.4	8.3								
Approach Delay (s)	8.5	8.9	8.4	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
HCM Level of Service			A									
Intersection Capacity Utilization			24.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Adams Ave & Chestnut Ave










4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	29	324	18	9	229	7	10	67	22	12	71	86
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	352	20	10	249	8	11	73	24	13	77	93
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	403	266	108	184								
Volume Left (vph)	32	10	11	13								
Volume Right (vph)	20	8	24	93								
Hadj (s)	0.02	0.02	-0.08	-0.26								
Departure Headway (s)	5.2	5.4	6.0	5.6								
Degree Utilization, x	0.58	0.40	0.18	0.29								
Capacity (veh/h)	659	622	513	565								
Control Delay (s)	15.3	12.0	10.3	10.9								
Approach Delay (s)	15.3	12.0	10.3	10.9								
Approach LOS	C	B	B	B								
Intersection Summary												
Delay			13.0									
HCM Level of Service			B									
Intersection Capacity Utilization			48.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: Clayton Ave & SR 99 SB off ramp










4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	43	36	0	23	6
Sign Control	Free			Stop	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	47	39	0	25	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		12	0	0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		12	0	0	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		96	100	97	99
cM capacity (veh/h)	1623		977	896	896	1085
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	47	39	32			
Volume Left	0	39	0			
Volume Right	47	0	7			
cSH	1700	977	929			
Volume to Capacity	0.03	0.04	0.03			
Queue Length 95th (ft)	0	3	3			
Control Delay (s)	0.0	8.8	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	8.8	9.0			
Approach LOS		A	A			
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: Clayton Ave & SR 99 SB off ramp
















4/25/2011

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	137	79	0	178	20
Sign Control	Free			Stop	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	149	86	0	193	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		97	0	0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		97	0	0	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		88	100	78	98
cM capacity (veh/h)	1623		724	896	896	1085
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	149	86	215			
Volume Left	0	86	0			
Volume Right	149	0	22			
cSH	1700	724	912			
Volume to Capacity	0.09	0.12	0.24			
Queue Length 95th (ft)	0	10	23			
Control Delay (s)	0.0	10.6	10.2			
Lane LOS		B	B			
Approach Delay (s)	0.0	10.6	10.2			
Approach LOS		B	B			
Intersection Summary						
Average Delay			6.9			
Intersection Capacity Utilization			25.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: SR 99 NB off ramp &
















4/25/2011

										
Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations										
Volume (veh/h)	0	0	79	75	0	0	889	18	22	774
Sign Control	Stop			Free			Free		Stop	
Grade	0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	86	82	0	0	966	20	24	841
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type				None			None			
Median storage (veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	1201	1229	986			82			1239	41
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1201	1229	986			82			1239	41
tC, single (s)	7.5	6.5	4.1			4.1			6.5	6.9
tC, 2 stage (s)										
tF (s)	3.5	4.0	2.2			2.2			4.0	3.3
p0 queue free %	100	100	88			100			84	18
cM capacity (veh/h)	20	155	696			1514			153	1021
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	NW 1	NW 2			
Volume Total	86	41	41	644	342	24	841			
Volume Left	86	0	0	0	0	0	0			
Volume Right	0	0	0	0	20	0	841			
cSH	696	1700	1700	1700	1700	153	1021			
Volume to Capacity	0.12	0.02	0.02	0.38	0.20	0.16	0.82			
Queue Length 95th (ft)	10	0	0	0	0	13	244			
Control Delay (s)	10.9	0.0	0.0	0.0	0.0	32.9	22.5			
Lane LOS	B					D	C			
Approach Delay (s)	5.6			0.0		22.8				
Approach LOS						C				
Intersection Summary										
Average Delay			10.2							
Intersection Capacity Utilization			57.9%		ICU Level of Service				B	
Analysis Period (min)			15							

HCM Unsignalized Intersection Capacity Analysis

10: SR 99 NB off ramp &


















4/25/2011

										
Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations										
Volume (veh/h)	0	0	44	246	0	0	821	12	40	590
Sign Control	Stop			Free			Free		Stop	
Grade	0%			0%			0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	48	267	0	0	892	13	43	641
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type				None			None			
Median storage (veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	1150	1262	905			267			1268	134
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1150	1262	905			267			1268	134
tC, single (s)	7.5	6.5	4.1			4.1			6.5	6.9
tC, 2 stage (s)										
tF (s)	3.5	4.0	2.2			2.2			4.0	3.3
p0 queue free %	100	100	94			100			72	28
cM capacity (veh/h)	32	158	747			1293			156	891
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	NW 1	NW 2			
Volume Total	48	134	134	595	311	43	641			
Volume Left	48	0	0	0	0	0	0			
Volume Right	0	0	0	0	13	0	641			
cSH	747	1700	1700	1700	1700	156	891			
Volume to Capacity	0.06	0.08	0.08	0.35	0.18	0.28	0.72			
Queue Length 95th (ft)	5	0	0	0	0	27	160			
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	36.6	18.7			
Lane LOS	B					E	C			
Approach Delay (s)	1.5			0.0		19.8				
Approach LOS						C				
Intersection Summary										
Average Delay			7.4							
Intersection Capacity Utilization			50.0%		ICU Level of Service			A		
Analysis Period (min)			15							

HCM Unsignalized Intersection Capacity Analysis

11: SR 99 SB onramp & S Clovis Ave


















4/25/2011

											
Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations											
Volume (veh/h)	0	0	7	136	45	809	79	29	19	20	24
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	8	148	49	879	86	32	21	22	26
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											4
Median type				None			None				
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	2000	2064	117			148			1949	2023	59
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	2000	2064	117			148			1949	2023	59
tC, single (s)	7.5	6.5	4.1			4.1			7.5	6.5	6.9
tC, 2 stage (s)											
tF (s)	3.5	4.0	2.2			2.2			3.5	4.0	3.3
p0 queue free %	100	100	99			39			0	1	97
cM capacity (veh/h)	1	21	1469			1431			20	22	995
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SE 1				
Volume Total	8	99	98	879	57	60	68				
Volume Left	8	0	0	879	0	0	21				
Volume Right	0	0	49	0	0	32	26				
cSH	1469	1700	1700	1431	1700	1700	33				
Volume to Capacity	0.01	0.06	0.06	0.61	0.03	0.04	2.06				
Queue Length 95th (ft)	0	0	0	112	0	0	193				
Control Delay (s)	7.5	0.0	0.0	11.4	0.0	0.0	747.4				
Lane LOS	A			B			F				
Approach Delay (s)	0.3			10.1			747.4				
Approach LOS							F				
Intersection Summary											
Average Delay			48.3								
Intersection Capacity Utilization			63.4%		ICU Level of Service				B		
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis

11: SR 99 SB onramp & S Clovis Ave

4/25/2011



















											
Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations											
Volume (veh/h)	0	0	38	219	34	611	197	41	41	50	224
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	41	238	37	664	214	45	45	54	243
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											4
Median type				None			None				
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1802	1926	259			238			1766	1885	129
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1802	1926	259			238			1766	1885	129
tC, single (s)	7.5	6.5	4.1			4.1			7.5	6.5	6.9
tC, 2 stage (s)											
tF (s)	3.5	4.0	2.2			2.2			3.5	4.0	3.3
p0 queue free %	0	100	97			50			0	0	73
cM capacity (veh/h)	0	32	1303			1326			31	34	896
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SE 1				
Volume Total	41	159	116	664	143	116	342				
Volume Left	41	0	0	664	0	0	45				
Volume Right	0	0	37	0	0	45	243				
cSH	1303	1700	1700	1326	1700	1700	105				
Volume to Capacity	0.03	0.09	0.07	0.50	0.08	0.07	3.26				
Queue Length 95th (ft)	2	0	0	73	0	0	Err				
Control Delay (s)	7.9	0.0	0.0	10.4	0.0	0.0	Err				
Lane LOS	A			B			F				
Approach Delay (s)	1.0			7.5			Err				
Approach LOS							F				
Intersection Summary											
Average Delay			2169.3								
Intersection Capacity Utilization			56.0%		ICU Level of Service				B		
Analysis Period (min)			15								

**HANFORD HEAVY MAINTENANCE
NO-BUILD CONDITIONS**

HCM Signalized Intersection Capacity Analysis

1: Houston Ave & Central Valley Hwy



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	38	92	11	52	66	41	254	9	62	684	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1708			1727		1770	1853		1770	1854	
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1708			1727		1770	1853		1770	1854	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	41	100	12	57	72	45	276	10	67	743	25
RTOR Reduction (vph)	0	46	0	0	46	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	144	0	0	95	0	45	285	0	67	767	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		11.1			7.9		4.0	35.3		4.5	35.8	
Effective Green, g (s)		11.1			7.9		4.0	35.3		4.5	35.8	
Actuated g/C Ratio		0.15			0.11		0.05	0.47		0.06	0.48	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		253			182		95	874		106	887	
v/s Ratio Prot		c0.08			c0.06		0.03	0.15		c0.04	c0.41	
v/s Ratio Perm												
v/c Ratio		0.57			0.52		0.47	0.33		0.63	0.86	
Uniform Delay, d1		29.6			31.7		34.4	12.3		34.3	17.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.9			2.7		3.7	0.2		11.7	8.8	
Delay (s)		32.6			34.4		38.1	12.5		46.0	26.1	
Level of Service		C			C		D	B		D	C	
Approach Delay (s)		32.6			34.4			16.0			27.7	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			26.4			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			74.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Houston Ave & Central Valley Hwy

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	42	169	8	66	89	141	765	29	83	373	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.90			0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1674			1721		1770	1852		1770	1845	
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1674			1721		1770	1852		1770	1845	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	46	184	9	72	97	153	832	32	90	405	28
RTOR Reduction (vph)	0	105	0	0	50	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	152	0	0	128	0	153	863	0	90	431	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		11.4			10.8		10.2	34.9		6.0	30.7	
Effective Green, g (s)		11.4			10.8		10.2	34.9		6.0	30.7	
Actuated g/C Ratio		0.14			0.14		0.13	0.44		0.08	0.39	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		241			235		228	817		134	716	
v/s Ratio Prot		c0.09			c0.07		c0.09	c0.47		0.05	0.23	
v/s Ratio Perm												
v/c Ratio		0.63			0.54		0.67	1.06		0.67	0.60	
Uniform Delay, d1		31.9			31.9		32.9	22.1		35.6	19.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1			2.6		7.5	47.4		12.5	1.4	
Delay (s)		36.9			34.4		40.4	69.5		48.1	20.7	
Level of Service		D			C		D	E		D	C	
Approach Delay (s)		36.9			34.4			65.1			25.4	
Approach LOS		D			C			E			C	
Intersection Summary												
HCM Average Control Delay			48.2			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			79.1			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			79.2%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Houston Ave & 7Th Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	105	0	9	127	1	11	6	1	2	93	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	114	0	10	138	1	12	7	1	2	101	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	207	137	101	193	136	7	101			8		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207	137	101	193	136	7	101			8		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	85	100	99	82	100	99			100		
cM capacity (veh/h)	639	747	954	671	747	1075	1491			1613		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	122	149	20	103								
Volume Left	8	10	12	2								
Volume Right	0	1	1	0								
cSH	739	744	1491	1613								
Volume to Capacity	0.16	0.20	0.01	0.00								
Queue Length 95th (ft)	15	19	1	0								
Control Delay (s)	10.8	11.1	4.6	0.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.8	11.1	4.6	0.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			23.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Houston Ave & 7Th Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	142	72	33	161	1	10	345	4	54	0	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	154	78	36	175	1	11	375	4	59	0	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	624	538	19	691	554	377	38			379		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	624	538	19	691	554	377	38			379		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	64	93	84	58	100	99			95		
cM capacity (veh/h)	256	425	1059	229	415	669	1572			1179		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	237	212	390	97								
Volume Left	4	36	11	59								
Volume Right	78	1	4	38								
cSH	522	366	1572	1179								
Volume to Capacity	0.45	0.58	0.01	0.05								
Queue Length 95th (ft)	59	87	1	4								
Control Delay (s)	17.5	27.6	0.3	5.1								
Lane LOS	C	D	A	A								
Approach Delay (s)	17.5	27.6	0.3	5.1								
Approach LOS	C	D										
Intersection Summary												
Average Delay			11.3									
Intersection Capacity Utilization			59.9%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Idaho Ave & Central Valley Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	10	5	2	14	11	6	298	2	9	779	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	5	2	15	12	7	324	2	10	847	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1228	1210	851	1220	1213	325	855			326		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1228	1210	851	1220	1213	325	855			326		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	94	98	99	91	98	99			99		
cM capacity (veh/h)	141	180	360	146	179	716	785			1234		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	20	29	333	865								
Volume Left	3	2	7	10								
Volume Right	5	12	2	9								
cSH	198	251	785	1234								
Volume to Capacity	0.10	0.12	0.01	0.01								
Queue Length 95th (ft)	8	10	1	1								
Control Delay (s)	25.2	21.2	0.3	0.2								
Lane LOS	D	C	A	A								
Approach Delay (s)	25.2	21.2	0.3	0.2								
Approach LOS	D	C										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			56.0%			ICU Level of Service				8		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Idaho Ave & Central Valley Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	12	5	4	8	14	7	929	1	7	546	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	13	5	4	9	15	8	1010	1	8	593	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1655	1636	595	1648	1638	1010	597			1011		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1655	1636	595	1648	1638	1010	597			1011		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	87	99	94	91	95	99			99		
cM capacity (veh/h)	68	99	504	69	99	291	980			686		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	28	1018	604								
Volume Left	5	4	8	8								
Volume Right	5	15	1	3								
cSH	107	139	980	686								
Volume to Capacity	0.22	0.20	0.01	0.01								
Queue Length 95th (ft)	20	18	1	1								
Control Delay (s)	47.9	37.4	0.2	0.3								
Lane LOS	E	E	A	A								
Approach Delay (s)	47.9	37.4	0.2	0.3								
Approach LOS	E	E										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			63.0%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Idaho Ave & 7Th Ave

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	20	1	0	26	3	0	22	0	0	105	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	1	0	28	3	0	24	0	0	114	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	32			23			110	54	22	64	53	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			23			110	54	22	64	53	30
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	97	100	100	86	100
cM capacity (veh/h)	1581			1592			776	837	1055	910	839	1045
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	23	32	24	115								
Volume Left	0	0	0	0								
Volume Right	1	3	0	1								
cSH	1581	1592	837	840								
Volume to Capacity	0.00	0.00	0.03	0.14								
Queue Length 95th (ft)	0	0	2	12								
Control Delay (s)	0.0	0.0	9.4	10.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	9.4	10.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			7.1									
Intersection Capacity Utilization			15.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Idaho Ave & 7Th Ave

4/25/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	18	6	1	23	3	6	362	0	3	98	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	20	7	1	25	3	7	393	0	3	107	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	28			26			106	53	23	248	55	27
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	28			26			106	53	23	248	55	27
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	53	100	99	87	100
cM capacity (veh/h)	1585			1588			787	837	1054	445	836	1049
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	26	29	400	111								
Volume Left	0	1	7	3								
Volume Right	7	3	0	1								
cSH	1585	1588	837	816								
Volume to Capacity	0.00	0.00	0.48	0.14								
Queue Length 95th (ft)	0	0	66	12								
Control Delay (s)	0.0	0.3	13.2	10.1								
Lane LOS		A	B	B								
Approach Delay (s)	0.0	0.3	13.2	10.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			11.3									
Intersection Capacity Utilization			31.6%		ICU Level of Service				A			
Analysis Period (min)			15									

**WASCO HEAVY MAINTENANCE
NO-BUILD CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: Paso Robles Hwy & Wasco Pond Rd



















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	271	369	73	18	354	14	127	231	58	19	125	180
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	295	401	79	20	385	15	138	251	63	21	136	196
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	400			480			1717	1469	441	1610	1501	392
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	400			480			1717	1469	441	1610	1501	392
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	75			98			0	0	90	0	0	70
cM capacity (veh/h)	1159			1082			0	93	616	0	89	656
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	295	480	20	400	452	352						
Volume Left	295	0	20	0	138	21						
Volume Right	0	79	0	15	63	196						
cSH	1159	1700	1082	1700	0	0						
Volume to Capacity	0.25	0.28	0.02	0.24	Err	Err						
Queue Length 95th (ft)	25	0	1	0	Err	Err						
Control Delay (s)	9.2	0.0	8.4	0.0	Err	Err						
Lane LOS	A		A		F	F						
Approach Delay (s)	3.5		0.4		Err	Err						
Approach LOS					F	F						
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			89.2%		ICU Level of Service				E			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Paso Robles Hwy & Wasco Pond Rd


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	299	401	131	60	480	9	102	198	42	13	241	296
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	325	436	142	65	522	10	111	215	46	14	262	322
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	532			578			2262	1819	507	1896	1885	527
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	532			578			2262	1819	507	1896	1885	527
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	69			93			0	0	92	0	0	42
cM capacity (veh/h)	1036			995			0	50	566	0	45	551
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	325	578	65	532	372	598						
Volume Left	325	0	65	0	111	14						
Volume Right	0	142	0	10	46	322						
cSH	1036	1700	995	1700	0	0						
Volume to Capacity	0.31	0.34	0.07	0.31	Err	Err						
Queue Length 95th (ft)	34	0	5	0	Err	Err						
Control Delay (s)	10.1	0.0	8.9	0.0	Err	Err						
Lane LOS	B		A		F	F						
Approach Delay (s)	3.6		1.0		Err	Err						
Approach LOS					F	F						
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			105.8%		ICU Level of Service				G			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: 6th Street & Wasco Ave


















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	0	5	0	1	0	7	365	3	0	139	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	0	5	0	1	0	8	397	3	0	151	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	585	588	172	591	607	398	193			400		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585	588	172	591	607	398	193			400		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	99	100	100	100	99			100		
cM capacity (veh/h)	420	419	871	414	409	651	1380			1159		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	62	1	8	400	193							
Volume Left	57	0	8	0	0							
Volume Right	5	0	0	3	42							
cSH	440	409	1380	1700	1159							
Volume to Capacity	0.14	0.00	0.01	0.24	0.00							
Queue Length 95th (ft)	12	0	0	0	0							
Control Delay (s)	14.5	13.8	7.6	0.0	0.0							
Lane LOS	B	B	A									
Approach Delay (s)	14.5	13.8	0.1		0.0							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			35.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: 6th Street & Wasco Ave

4/25/2011

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	0	6	0	0	0	9	283	0	0	356	69
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	0	7	0	0	0	10	308	0	0	387	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	752	752	424	758	789	308	462			308		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	752	752	424	758	789	308	462			308		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	100	99	100	100	100	99			100		
cM capacity (veh/h)	325	336	630	318	320	732	1099			1253		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	72	0	10	308	462							
Volume Left	65	0	10	0	0							
Volume Right	7	0	0	0	75							
cSH	339	1700	1099	1700	1253							
Volume to Capacity	0.21	0.00	0.01	0.18	0.00							
Queue Length 95th (ft)	20	0	1	0	0							
Control Delay (s)	18.4	0.0	8.3	0.0	0.0							
Lane LOS	C	A	A									
Approach Delay (s)	18.4	0.0	0.3		0.0							
Approach LOS	C	A										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			33.3%			ICU Level of Service				A		
Analysis Period (min)			15									

**SHAFTER HEAVY MAINTENANCE
NO-BUILD CONDITIONS**

HCM Unsignalized Intersection Capacity Analysis

1: Burbank Street & Santa Fe Way

















4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	1	22	5	5	0	1	46	816	2	85	998	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	24	5	5	0	1	50	887	2	92	1085	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2259	2258	888	2275	2259	1085	1085			889		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2259	2258	888	2275	2259	1085	1085			889		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
pO queue free %	96	28	98	47	100	100	92			88		
cM capacity (veh/h)	25	33	343	10	33	263	643			762		
Direction, Lane #	EB 1	WB 1	SE 1	NW 1								
Volume Total	30	7	939	1177								
Volume Left	1	5	50	92								
Volume Right	5	1	2	0								
cSH	39	12	643	762								
Volume to Capacity	0.78	0.54	0.08	0.12								
Queue Length 95th (ft)	72	31	6	10								
Control Delay (s)	232.8	484.7	2.3	4.0								
Lane LOS	F	F	A	A								
Approach Delay (s)	232.8	484.7	2.3	4.0								
Approach LOS	F	F										
Intersection Summary												
Average Delay			8.0									
Intersection Capacity Utilization			91.0%		ICU Level of Service					E		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Burbank Street & Santa Fe Way













4/25/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	1	3	23	0	5	52	12	1175	1	24	969	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	3	25	0	5	57	13	1277	1	26	1053	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2490	2452	1278	2457	2431	1074	1096			1278		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2490	2452	1278	2457	2431	1074	1096			1278		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	89	88	100	82	79	98			95		
cM capacity (veh/h)	13	29	203	16	30	267	637			543		
Direction, Lane #	EB 1	WB 1	SE 1	NW 1								
Volume Total	29	62	1291	1122								
Volume Left	1	0	13	26								
Volume Right	25	57	1	42								
cSH	91	157	637	543								
Volume to Capacity	0.32	0.39	0.02	0.05								
Queue Length 95th (ft)	31	43	2	4								
Control Delay (s)	62.1	42.1	1.0	1.9								
Lane LOS	F	E	A	A								
Approach Delay (s)	62.1	42.1	1.0	1.9								
Approach LOS	F	E										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			78.5%			ICU Level of Service				D		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

2: Galpin & Santa Fe Way













4/25/2011

						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	197	12	546	216	45	1022
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	13	593	235	49	1111
RTOR Reduction (vph)	0	11	0	102	0	0
Lane Group Flow (vph)	214	2	593	133	49	1111
Turn Type		Prot		Perm	Prot	
Protected Phases	3	3	6		5	2
Permitted Phases				6		
Actuated Green, G (s)	9.6	9.6	34.2	34.2	4.5	42.7
Effective Green, g (s)	9.6	9.6	34.2	34.2	4.5	42.7
Actuated g/C Ratio	0.16	0.16	0.57	0.57	0.07	0.71
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	282	252	1057	898	132	1319
v/s Ratio Prot	c0.12	0.00	0.32		0.03	c0.60
v/s Ratio Perm				0.08		
v/c Ratio	0.76	0.01	0.56	0.15	0.37	0.84
Uniform Delay, d1	24.2	21.3	8.3	6.2	26.6	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	0.0	0.7	0.1	1.8	5.1
Delay (s)	35.4	21.4	9.0	6.2	28.3	11.4
Level of Service	D	C	A	A	C	B
Approach Delay (s)	34.6		8.2			12.1
Approach LOS	C		A			B
Intersection Summary						
HCM Average Control Delay			13.0		HCM Level of Service	B
HCM Volume to Capacity ratio			0.83			
Actuated Cycle Length (s)			60.3		Sum of lost time (s)	8.0
Intersection Capacity Utilization			71.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

2: Galpin & Santa Fe Way

4/25/2011


















						
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	244	21	1026	58	9	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	265	23	1115	63	10	841
RTOR Reduction (vph)	0	19	0	10	0	0
Lane Group Flow (vph)	265	4	1115	53	10	841
Turn Type		Prot		Perm	Prot	
Protected Phases	3	3	6		5	2
Permitted Phases				6		
Actuated Green, G (s)	14.9	14.9	55.6	55.6	1.3	60.9
Effective Green, g (s)	14.9	14.9	55.6	55.6	1.3	60.9
Actuated g/C Ratio	0.18	0.18	0.66	0.66	0.02	0.73
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	315	281	1236	1050	27	1354
v/s Ratio Prot	c0.15	0.00	c0.60		0.01	c0.45
v/s Ratio Perm				0.03		
v/c Ratio	0.84	0.01	0.90	0.05	0.37	0.62
Uniform Delay, d1	33.3	28.4	11.8	4.9	40.8	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.0	0.0	9.3	0.0	8.4	0.9
Delay (s)	51.3	28.4	21.1	4.9	49.2	6.6
Level of Service	D	C	C	A	D	A
Approach Delay (s)	49.5		20.3			7.1
Approach LOS	D		C			A
Intersection Summary						
HCM Average Control Delay			19.1		HCM Level of Service	B
HCM Volume to Capacity ratio			0.90			
Actuated Cycle Length (s)			83.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			74.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

CORCORAN NO-BUILD CONDITIONS

HCM Unsignalized Intersection Capacity Analysis

1: Brokaw Ave & Chittenden Ave


















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	28	6	4	24	0	5	0	23	0	60	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	30	7	4	26	0	5	0	25	0	65	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											284	
pX, platoon unblocked												
vC, conflicting volume	103	115	46	65	103	0	92			25		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	103	115	46	65	103	0	92			25		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	96	99	100	97	100	100			100		
cM capacity (veh/h)	843	772	1013	885	783	1084	1500			1588		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	37	30	5	25	43	49						
Volume Left	0	4	5	0	0	0						
Volume Right	7	0	0	25	0	27						
cSH	806	796	1500	1700	1700	1700						
Volume to Capacity	0.05	0.04	0.00	0.01	0.03	0.03						
Queue Length 95th (ft)	4	3	0	0	0	0						
Control Delay (s)	9.7	9.7	7.4	0.0	0.0	0.0						
Lane LOS	A	A	A									
Approach Delay (s)	9.7	9.7	1.3		0.0							
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			15.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Brokaw Ave & Chittenden Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	34	6	3	21	0	16	0	41	0	76	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	37	7	3	23	0	17	0	45	0	83	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											284	
pX, platoon unblocked												
vC, conflicting volume	140	173	52	101	139	0	104			45		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140	173	52	101	139	0	104			45		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	99	100	97	100	99			100		
cM capacity (veh/h)	790	711	1004	822	742	1084	1485			1562		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	43	26	17	45	55	49						
Volume Left	0	3	17	0	0	0						
Volume Right	7	0	0	45	0	22						
cSH	744	751	1485	1700	1700	1700						
Volume to Capacity	0.06	0.03	0.01	0.03	0.03	0.03						
Queue Length 95th (ft)	5	3	1	0	0	0						
Control Delay (s)	10.1	10.0	7.5	0.0	0.0	0.0						
Lane LOS	B	A	A									
Approach Delay (s)	10.1	10.0	2.1		0.0							
Approach LOS	B	A										
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			17.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Whitley Ave & Chittenden Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	107	10	5	72	8	6	14	8	9	21	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	116	11	5	78	9	7	15	9	10	23	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	87			127			303	263	122	275	264	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	87			127			303	263	122	275	264	83
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	98	99	98	96	97
cM capacity (veh/h)	1509			1459			602	630	929	650	630	977
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	149	92	30	65								
Volume Left	22	5	7	10								
Volume Right	11	9	9	33								
cSH	1509	1459	687	770								
Volume to Capacity	0.01	0.00	0.04	0.08								
Queue Length 95th (ft)	1	0	3	7								
Control Delay (s)	1.2	0.5	10.5	10.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.2	0.5	10.5	10.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			23.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Whitley Ave & Chittenden Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	142	20	12	329	15	11	21	8	5	30	47
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	154	22	13	358	16	12	23	9	5	33	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	374			176			714	654	165	666	657	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374			176			714	654	165	666	657	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			96	94	99	98	91	92
cM capacity (veh/h)	1185			1400			288	368	879	339	367	679
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	221	387	43	89								
Volume Left	45	13	12	5								
Volume Right	22	16	9	51								
cSH	1185	1400	383	495								
Volume to Capacity	0.04	0.01	0.11	0.18								
Queue Length 95th (ft)	3	1	10	16								
Control Delay (s)	1.9	0.3	15.6	13.9								
Lane LOS	A	A	C	B								
Approach Delay (s)	1.9	0.3	15.6	13.9								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			40.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Whitley Ave & Pickerell Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	70	9	12	44	2	4	11	13	3	240	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	76	10	13	48	2	4	12	14	3	261	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	50			86			328	194	43	170	198	25
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			86			328	194	43	170	198	25
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	98	99	100	62	97
cM capacity (veh/h)	1555			1508			405	686	1018	745	683	1045
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	57	48	37	26	30	293						
Volume Left	18	0	13	0	4	3						
Volume Right	0	10	0	2	14	29						
cSH	1555	1700	1508	1700	724	708						
Volume to Capacity	0.01	0.03	0.01	0.02	0.04	0.41						
Queue Length 95th (ft)	1	0	1	0	3	51						
Control Delay (s)	2.5	0.0	2.7	0.0	10.2	13.6						
Lane LOS	A		A		B	B						
Approach Delay (s)	1.3		1.6		10.2	13.6						
Approach LOS					B	B						
Intersection Summary												
Average Delay			9.3									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Whitley Ave & Pickereil Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	63	87	6	12	71	5	11	254	26	4	28	26
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	95	7	13	77	5	12	276	28	4	30	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	83			101			343	343	51	457	344	41
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	83			101			343	343	51	457	344	41
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			98	50	97	98	94	97
cM capacity (veh/h)	1513			1489			524	547	1007	275	546	1021
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	116	54	52	44	316	63						
Volume Left	68	0	13	0	12	4						
Volume Right	0	7	0	5	28	28						
cSH	1513	1700	1489	1700	569	635						
Volume to Capacity	0.05	0.03	0.01	0.03	0.56	0.10						
Queue Length 95th (ft)	4	0	1	0	85	8						
Control Delay (s)	4.6	0.0	1.9	0.0	19.0	11.3						
Lane LOS	A		A		C	B						
Approach Delay (s)	3.1		1.0		19.0	11.3						
Approach LOS					C	B						
Intersection Summary												
Average Delay			11.4									
Intersection Capacity Utilization			34.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Sherman Ave & Santa Fe Ave

















5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	4	261	0	4	7	21	8	1	5	252	24
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	4	284	0	4	8	23	9	1	5	274	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	362	353	287	639	340	9	274			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	362	353	287	639	340	9	274			10		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	62	100	99	99	98			100		
cM capacity (veh/h)	576	560	752	237	570	1072	1289			1610		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	314	12	33	305								
Volume Left	26	0	23	5								
Volume Right	284	8	1	26								
cSH	730	812	1289	1610								
Volume to Capacity	0.43	0.01	0.02	0.00								
Queue Length 95th (ft)	54	1	1	0								
Control Delay (s)	13.6	9.5	5.5	0.2								
Lane LOS	B	A	A	A								
Approach Delay (s)	13.6	9.5	5.5	0.2								
Approach LOS	B	A										
Intersection Summary												
Average Delay			6.9									
Intersection Capacity Utilization			45.9%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: Sherman Ave &

5/24/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	2	19	0	5	2	484	291	0	1	33	30
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	2	21	0	5	2	526	316	0	1	36	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1428	1423	52	1445	1407	316	36			316		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1428	1423	52	1445	1407	316	36			316		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	74	98	98	100	94	100	67			100		
cM capacity (veh/h)	80	90	1015	78	93	724	1575			1244		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	43	8	842	70								
Volume Left	21	0	526	1								
Volume Right	21	2	0	33								
cSH	143	123	1575	1244								
Volume to Capacity	0.30	0.06	0.33	0.00								
Queue Length 95th (ft)	30	5	37	0								
Control Delay (s)	40.7	36.1	6.6	0.1								
Lane LOS	E	E	A	A								
Approach Delay (s)	40.7	36.1	6.6	0.1								
Approach LOS	E	E										
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			64.4%			ICU Level of Service				C		
Analysis Period (min)			15									